

FORM PTO-1390 (Modified) (REV 11-2000)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTORNEY'S DOCKET NUMBER <b>PG4159USW</b>	
<b>TRANSMITTAL LETTER TO THE UNITED STATES</b> <b>DESIGNATED/ELECTED OFFICE (DO/EO/US)</b> <b>CONCERNING A FILING UNDER 35 U.S.C. 371</b>		U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR <b>10 / 089708</b>			
INTERNATIONAL APPLICATION NO. <b>PCT/EP00/09292</b>	INTERNATIONAL FILING DATE <b>22 September 2000</b>	PRIORITY DATE CLAIMED <b>01 October 1999</b>			
<b>TITLE OF INVENTION</b> <b>PATIENT DATA MONITORING SYSTEM</b>					
<b>APPLICANT(S) FOR DO/EO/US</b> <b>ANDERSON, Gregor John McLennan; BONNEY, Stanley George; JONES, Anthony Patrick; ROBERTSON, Duncan</b>					
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:					
<ol style="list-style-type: none"> <li>1. <input checked="" type="checkbox"/> This is a <b>FIRST</b> submission of items concerning a filing under 35 U.S.C. 371.</li> <li>2. <input type="checkbox"/> This is a <b>SECOND</b> or <b>SUBSEQUENT</b> submission of items concerning a filing under 35 U.S.C. 371.</li> <li>3. <input checked="" type="checkbox"/> This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (24) indicated below.</li> <li>4. <input checked="" type="checkbox"/> The US has been elected by the expiration of 19 months from the priority date (Article 31).</li> <li>5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371 (c) (2))             <ol style="list-style-type: none"> <li>a. <input type="checkbox"/> is attached hereto (required only if not communicated by the International Bureau).</li> <li>b. <input checked="" type="checkbox"/> has been communicated by the International Bureau.</li> <li>c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US).</li> </ol> </li> <li>6. <input type="checkbox"/> An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).             <ol style="list-style-type: none"> <li>a. <input type="checkbox"/> is attached hereto.</li> <li>b. <input type="checkbox"/> has been previously submitted under 35 U.S.C. 154(d)(4).</li> </ol> </li> <li>7. <input checked="" type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))             <ol style="list-style-type: none"> <li>a. <input type="checkbox"/> are attached hereto (required only if not communicated by the International Bureau).</li> <li>b. <input type="checkbox"/> have been communicated by the International Bureau.</li> <li>c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired.</li> <li>d. <input checked="" type="checkbox"/> have not been made and will not be made.</li> </ol> </li> <li>8. <input type="checkbox"/> An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).</li> <li>9. <input type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).</li> <li>10. <input type="checkbox"/> An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).</li> <li>11. <input checked="" type="checkbox"/> A copy of the International Preliminary Examination Report (PCT/IPEA/409).</li> <li>12. <input checked="" type="checkbox"/> A copy of the International Search Report (PCT/ISA/210).</li> </ol>					
<b>Items 13 to 20 below concern document(s) or information included:</b>					
<ol style="list-style-type: none"> <li>13. <input checked="" type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98.</li> <li>14. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.</li> <li>15. <input checked="" type="checkbox"/> A <b>FIRST</b> preliminary amendment.</li> <li>16. <input type="checkbox"/> A <b>SECOND</b> or <b>SUBSEQUENT</b> preliminary amendment.</li> <li>17. <input type="checkbox"/> A substitute specification.</li> <li>18. <input type="checkbox"/> A change of power of attorney and/or address letter.</li> <li>19. <input type="checkbox"/> A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.</li> <li>20. <input type="checkbox"/> A second copy of the published international application under 35 U.S.C. 154(d)(4).</li> <li>21. <input type="checkbox"/> A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).</li> <li>22. <input checked="" type="checkbox"/> Certificate of Mailing by Express Mail</li> <li>23. <input checked="" type="checkbox"/> Other items or information:</li> </ol>					
<b>PCT Request</b> <b>Cover Page of WO 01/26020</b>					

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR <b>10/089708</b>	INTERNATIONAL APPLICATION NO. <b>PCT/EP00/09292</b>	ATTORNEY'S DOCKET NUMBER <b>PG4159USW</b>
--	--	--

24. The following fees are submitted:

**BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) :**

- |  |           |
|--|-----------|
| <input type="checkbox"/> Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO ..... | \$1040.00 |
| <input checked="" type="checkbox"/> International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO .....  | \$890.00  |
| <input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO .....  | \$740.00  |
| <input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) .....   | \$710.00  |
| <input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) .....   | \$100.00  |

**CALCULATIONS PTO USE ONLY**

**ENTER APPROPRIATE BASIC FEE AMOUNT =**

**\$890.00**

Surcharge of **\$130.00** for furnishing the oath or declaration later than months from the earliest claimed priority date (37 CFR 1.492 (e)).

20     30

**\$0.00**

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	
Total claims	78 - 20 =	58	x \$18.00	<b>\$1,044.00</b>
Independent claims	4 - 3 =	1	x \$84.00	<b>\$84.00</b>
Multiple Dependent Claims (check if applicable).			<input type="checkbox"/>	<b>\$0.00</b>
<b>TOTAL OF ABOVE CALCULATIONS =</b>				<b>\$2,018.00</b>
<input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27). The fees indicated above are reduced by 1/2.				<b>\$0.00</b>
<b>SUBTOTAL =</b>				<b>\$2,018.00</b>
Processing fee of <b>\$130.00</b> for furnishing the English translation later than months from the earliest claimed priority date (37 CFR 1.492 (f)).				<input type="checkbox"/> 20 <input type="checkbox"/> 30 + <b>\$0.00</b>
<b>TOTAL NATIONAL FEE =</b>				<b>\$2,018.00</b>
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) (check if applicable).				<input type="checkbox"/> <b>\$0.00</b>
<b>TOTAL FEES ENCLOSED =</b>				<b>\$2,018.00</b>
				<b>Amount to be:</b>
				<b>refunded</b> <b>\$</b>
				<b>charged</b> <b>\$</b>

- a.  A check in the amount of \_\_\_\_\_ to cover the above fees is enclosed.
- b.  Please charge my Deposit Account No. 07-1392 in the amount of \$2,018.00 to cover the above fees. A duplicate copy of this sheet is enclosed.
- c.  The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 07-1392. A duplicate copy of this sheet is enclosed.
- d.  Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. **Credit card information should not be included on this form.** Provide credit card information and authorization on PTO-2038.

**NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.**

SEND ALL CORRESPONDENCE TO:

 <b>23347</b> <small>PATENT TRADEMARK OFFICE</small>
---

  
**SIGNATURE**

**James P. Riek**

**NAME**

**39,009**

**REGISTRATION NUMBER**

**1 April 2002**

**DATE**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of:  
International Filing No.:  
International Filing Date:  
Title:

**ANDERSON, et al.**  
**PCT/EP00/09292**  
**22 Sept. 2000**  
**PATIENT DATA MONITORING SYSTEM**

Grp./A.U.:  
Examiner:

Docket No.: **PG4159USW**

---

Commissioner of Patents  
Washington, DC 20231

**FIRST PRELIMINARY AMENDMENT**

Dear Sir:

The above-identified application is being transmitted herewith for entry in the United States National Phase under Chapter II of the PCT for the Purposes of adding priority information.

**In the Abstract:**

Please substitute the attached Abstract, which has been placed on a separate sheet of paper according to US practice, as required under 37 CFR 1.72(b).

**In the Specification:**

On the first line of the specification, after the Title, please add:

--This application is filed pursuant to 35 USC 371 as a United States National Phase Application of Serial No. PCT/EP00/09292 filed 22 Sept. 2000, which claims

priority from GB 9923273.8, filed 1 October 1999; GB 0011029.6 filed 9 May 2000; and  
GB 0020541.9 filed 22 August 2000, all in the United Kingdom .--

**In the Claims:**

Cancel the first Claim 60.

Please amend the claims as follows:

4. (Amended) A system according to Claim 1, wherein said patient data comprises diagnostic data for use in diagnosing each patient's medical condition.
5. (Amended) A system according to Claim 1, wherein said patient data comprises compliance data for use in assessing each patient's compliance with a treatment or prescribing regime.
6. (Amended) A system according to Claim 1, wherein each patient has a similar or identical medical condition.
7. (Amended) A system according to Claim 1, wherein each patient is on a similar or identical treatment or prescribing regime.
8. (Amended) A system according to Claim 1, wherein each patient electronic data collector is under the control of an individual patient.
9. (Amended) A system according to Claim 1, wherein any patient electronic data collector is integrated with a system for the delivery of medicament.

13. (Amended) A system according to Claim 9, wherein the patient electronic data collector and the system for delivery of medicament are comprised within a handheld device.
14. (Amended) A system according to Claim 1, wherein the communicator is capable of communicating wirelessly with the entrypoint to the network computer system.
15. (Amended) A system according to Claim 1, wherein the patient data is communicable between the patient electronic data collector and the network computer system in encrypted form.
16. (Amended) A system according to Claim 1, wherein the patient data is continuously communicable between the patient electronic data collector and the network computer system.
17. (Amended) A system according to Claim 1, wherein the patient data is communicable in packet form between the patient electronic data collector and the network computer system.
18. (Amended) A system according to Claim 1, wherein the network computer system is under the control of a healthcare data manager.
20. (Amended) A system according to Claim 1, wherein the first patient-specific database and the second condition-specific database are separate from each other.
21. (Amended) A system according to Claim 1, wherein the first patient-specific database is a sub-database of the second condition-specific database.

22. (Amended) A system according to Claim 1, wherein the data within either database is partitioned according to level of confidentiality or level of commercial sensitivity.
23. (Amended) A system according to Claim 1, wherein the first and second secure access gateways are distinct from each other.
24. (Amended) A system according to Claim 1, wherein the first and second secure access gateways are coupled or arranged in series.
25. (Amended) A system according to Claim 1, wherein the secure access gateways are password protected.
26. (Amended) A system according to Claim 1, wherein the first and second user authorisation commands are distinct.
27. (Amended) A system according to Claim 1, wherein the first and second user authorisation commands are identical.
28. (Amended) A system according to Claim 1, wherein the authorised users are selected from the group consisting of the patient, a healthcare professional, a pharmacist, an emergency assistance provider, a research professional, a database manager and any combinations thereof.
29. (Amended) A system according to Claim 1, wherein access to either one or both of the databases involves payment of a fee through an electronic payment means.

30. (Amended) A system according to Claim 1, wherein communication of patient data to either one or both of the databases results in award of an incentive payment through an electronic payment means.
31. (Amended) A system according to Claim 1, enabling the patient to define permissions or authorisations at the time of data collection, data transfer, data storage and data access.
32. (Amended) A system according to Claim 1, wherein information from a remote datasource is made available to the network computer system.
35. (Amended) A system according to Claim 1, wherein the patient electronic data collector further comprises a patient electronic data management system comprising
- a memory for storage of data;
  - a microprocessor for performing operations on said data; and
  - a transmitter for transmitting a signal relating to the data or the outcome of an operation on the data.
37. (Amended) A system according to Claim 35, wherein the communicator enables two-way transfer of data between the network computer system and the patient electronic data management system.
38. (Amended) A system according to Claim 1, additionally comprising an authorised user data communicator comprising
- an authorised user electronic data management system comprising

a memory for storage of data;  
a microprocessor for performing operations on said data; and  
a transmitter for transmitting a signal relating to the data or the outcome of an operation on the data; and  
a communicator for communicating with an entrypoint to a network computer system to enable communication of data between the network computer system and the authorised user electronic data management system.

40. (Amended) A system according to Claim 1, wherein any communicator employs radiofrequency or optical signals.
41. (Amended) A system according to Claim 1, wherein any communicator communicates with the network computer system via a gateway thereto.
42. (Amended) A system according to Claim 1, wherein the communicator includes an embedded network server.
43. (Amended) A system according to Claim 1, wherein the communicator communicates with the network computer system via a second communications device having telecommunications capability.
45. (Amended) A system according to Claim 42, wherein the communicator communicates with the second communications device using spread spectrum radiofrequency signals.

46. (Amended) A system according to Claim 1, wherein the communicator communicates with a specifiable network address of the network computer system.
48. (Amended) A system according to Claim 35, wherein the patient electronic data management system additionally comprises a data input system for patient input of data to the electronic data management system.
50. (Amended) A system according to Claim 35, additionally comprising a display for display of data from the patient electronic data management system to the patient.
51. (Amended) A system according to Claim 1, wherein the plural patients have related respiratory conditions and each patient electronic data collector additionally comprises a sensor which senses the breath of a user, wherein the sensor communicates breath data to the patient electronic data collector.
59. (Amended) A system according to Claim 51, wherein said breath data includes breath cycle data.
60. (Amended) A system according to Claim 1, wherein the plural patients have related cardiovascular conditions and each patient electronic data collector additionally comprises a sensor which senses the cardiovascular activity of a patient, wherein the sensor communicates cardiovascular data to the patient electronic data collector.
65. (Amended) A method according to Claim 62, comprising communicating the data in encrypted form.
66. (Amended) A method according to Claim 62, wherein the data is continuously communicable.

67. (Amended) A method according to Claim 62, wherein the data is communicable in packet form.

68. (Amended) A method according to Claim 62, comprising permitting different levels of access to the data to different authorised users.

69. (Amended) A method according to Claim 62, additionally comprising

a first authorised user communicating a prescription authorisation command to the network computer system;

a second authorised user receiving said prescription authorisation command from the network computer system; and

said second authorised user preparing the prescription based on the prescription authorisation.

70. (Amended) A method according to Claim 62, additionally comprising

a first authorised user communicating a prescription authorisation command to a pharmacy network computer system;

a second authorised user receiving said prescription authorisation command from the pharmacy network computer system; and

said second authorised user preparing the prescription for the patient based on the prescription authorisation,

wherein the pharmacy network computer system is arranged for communication with the network computer system.

71. (Amended) A method according to Claim 69, wherein the first authorised user communicates the prescription authorisation in response to a ‘update prescription’ alerting signal visible at a patient-specific network address on the network computer system.

72. (Amended) A network computer system for use with the system according to Claim 1 comprising

an interface capable of receiving patient data in electronic form from plural patient electronic data collectors;

associated with said interface, a first patient-specific database and a second condition-specific database for storing said patient data; and

an authorised user inquiry system comprising either or both of

(a) a first secure access gateway permitting access to the first patient-specific database in response to a first user authorisation command;

first search means for searching said patient-specific database in response to a first authorised user inquiry; and

first results transmitting means for transmitting the results of said first authorised user inquiry to the first authorised user;

(b) a second secure access gateway permitting access to the second condition-specific database in response to a second user authorisation command;

second search means for searching said second condition-specific database in response to a second authorised user inquiry; and

second results transmitting means for transmitting the results of said second authorised user inquiry to the second authorised user,

wherein the patient data originates remotely from the network computer system.

76. (Amended) A computer program comprising program means for, when executed on a computer, instructing the computer to perform all of the steps Claim 74.

**Add the following new Claim:**

--78. A system according to Claim 51, wherein said breath data includes peak flow data.--

**REMARKS/ ARGUMENTS:**

Claims 1-78 remain in this application. Applicants have amended the specification for purposes of adding the priority information. The application as filed with the PCT contained two (2) Claim 60s. The first Claim 60 has been cancelled, and has been added as new Claim 78 (in a form deleting multiple dependencies). Claims 4-9, 13-18, 20-32, 35, 37, 38, 40-43, 45, 46, 48, 50, 51, 59, 60, 65-72 and 76 have been amended to delete multiple dependencies. Applicants have attached an Abstract on a separate sheet of paper as required by US practice.

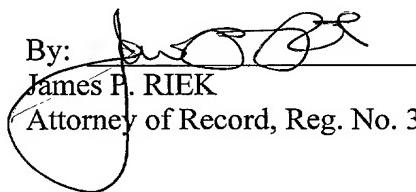
PG4159USW  
Int'l Appl. No.: PCT/EP00/09292  
Preliminary Amendment

Attached hereto is a marked-up version of the changes made to the specification and Claims by the current amendment. The Attached page is Captioned "Version with Markings to Show Changes Made."

It is respectfully submitted that the present application is in condition for allowance. An early consideration and Notice of Allowance are earnestly solicited.

Respectfully submitted:

Date: 7 April 2002

By:   
James P. RIEK  
Attorney of Record, Reg. No. 39,009

GlaxoSmithKline  
Corporate Intellectual Property  
Five Moore Drive, PO Box 13398  
Research Triangle Park, NC 27709-3398  
Telephone: 919-483-2370  
Fax: 919-483-7988

## PATIENT DATA MONITORING SYSTEM

### ABSTRACT

There is provided a system for collecting and providing selective access to medical data relevant to plural patients having related medical conditions. The system comprises a network computer system (50) and associated with the network computer system (50) a first patient-specific database and a second condition-specific database. Remote from the network computer system (50) there are provided plural patient electronic data collectors (10), each for collecting patient data relevant to a particular patient's medical condition. Associated with each patient electronic data collector (10), there is a communicator (40) for communicating with an entrypoint to the network computer system (50) to enable transfer of said patient data to the first patient-specific database and to the second condition-specific database. The system includes a first secure access gateway permitting access to the first patient-specific database in response to a first user authorisation command and a second secure access gateway permitting access to the second condition-specific database in response to a second user authorisation command.

**Marked Version to Show Changes Made**

**In the Specification:**

The following paragraph was added after the Title:

--This application is filed pursuant to 35 USC 371 as a United States National Phase Application of Serial No. PCT/EP00/09292 filed 22 Sept. 2000, which claims priority from GB 9923273.8, filed 1 October 1999; GB 0011029.6 filed 9 May 2000; and GB 0020541.9 filed 22 August 2000, all in the United Kingdom .--

**In the Claims:**

Claims 4-9, 13-18, 20-32, 35, 37, 38, 40-43, 45, 46, 48, 50, 51, 59, 60, 65-72 and 76 were amended as follows:

1. A system for collecting and providing selective access to medical data relevant to plural patients having related medical conditions comprising

a network computer system;

associated with the network computer system, a first patient-specific database and a second condition-specific database;

remote from said network computer system, plural patient electronic data collectors, each for collecting patient data relevant to a particular patient's medical condition;

associated with each patient electronic data collector, a communicator for communicating with an entrypoint to said network computer system to enable transfer of said patient data to said first patient-specific database and to said second condition-specific database;

a first secure access gateway permitting access to the first patient-specific database in response to a first user authorisation command; and

a second secure access gateway permitting access to the second condition-specific database in response to a second user authorisation command.

2. A system according to claim 1, wherein said patient electronic data collector collects said patient data on a regular basis.
3. A system according to claim 2, wherein the patient electronic data collector collects the patient data on a continuous basis.
4. (Amended) A system according to Claim 1 any of claims 1 to 3, wherein said patient data comprises diagnostic data for use in diagnosing each patient's medical condition.
5. (Amended) A system according to Claim 1 any of claims 1 to 3, wherein said patient data comprises compliance data for use in assessing each patient's compliance with a treatment or prescribing regime.
6. (Amended) A system according to Claim 1 any of claims 1 to 5, wherein each patient has a similar or identical medical condition.
7. (Amended) A system according to Claim 1 any of claims 1 to 6, wherein each patient is on a similar or identical treatment or prescribing regime.
8. (Amended) A system according to Claim 1 any of claims 1 to 7, wherein each patient electronic data collector is under the control of an individual patient.
9. (Amended) A system according to Claim 1 any of claims 1 to 8, wherein any patient electronic data collector is integrated with a system for the delivery of medicament.
10. A system according to claim 9, wherein the medicament delivery system provides respirable delivery of medicament to the patient.
11. A system according to claim 9, wherein the medicament delivery system provides injectable delivery of medicament to the patient.
12. A system according to claim 9, wherein the medicament delivery system is an implant in the body of the patient.

13. (Amended) A system according to Claim 9 any of claim 9 to 11, wherein the patient electronic data collector and the system for delivery of medicament are comprised within a handheld device.
14. (Amended) A system according to Claim 1 any of claims 1 to 13, wherein the communicator is capable of communicating wirelessly with the entrypoint to the network computer system.
15. (Amended) A system according to Claim 1 any of claims 1 to 14, wherein the patient data is communicable between the patient electronic data collector and the network computer system in encrypted form.
16. (Amended) A system according to Claim 1 any of claims 1 to 15, wherein the patient data is continuously communicable between the patient electronic data collector and the network computer system.
17. (Amended) A system according to Claim 1 any of claims 1 to 16, wherein the patient data is communicable in packet form between the patient electronic data collector and the network computer system.
18. (Amended) A system according to Claim 1 any of claims 1 to 17, wherein the network computer system is under the control of a healthcare data manager.
19. A system according to claim 18, wherein the healthcare data manager is associated with a healthcare organisation selected from the group consisting of a doctor's practice, a hospital, a healthcare management centre and a pharmaceutical company.
20. (Amended) A system according to Claim 1 any of claims 1 to 19, wherein the first patient-specific database and the second condition-specific database are separate from each other.
21. (Amended) A system according to Claim 1 any of claims 1 to 19, wherein the first patient-specific database is a sub-database of the second condition-specific database.
22. (Amended) A system according to Claim 1 any of claims 1 to 21, wherein the data within either database is partitioned according to level of confidentiality or level of commercial sensitivity.
23. (Amended) A system according to Claim 1 any of claims 1 to 22, wherein the first and second secure access gateways are distinct from each other.

24. (Amended) A system according to Claim 1 any of claims 1 to 22, wherein the first and second secure access gateways are coupled or arranged in series.
25. (Amended) A system according to Claim 1 any of claims 1 to 24, wherein the secure access gateways are password protected.
26. (Amended) A system according to Claim 1 any of claims 1 to 25, wherein the first and second user authorisation commands are distinct.
27. (Amended) A system according to Claim 1 any of claims 1 to 25, wherein the first and second user authorisation commands are identical.
28. (Amended) A system according to Claim 1 any of claims 1 to 27, wherein the authorised users are selected from the group consisting of the patient, a healthcare professional, a pharmacist, an emergency assistance provider, a research professional, a database manager and any combinations thereof.
29. (Amended) A system according to Claim 1 any of claims 1 to 28, wherein access to either one or both of the databases involves payment of a fee through an electronic payment means.
30. (Amended) A system according to Claim 1 any of claims 1 to 29, wherein communication of patient data to either one or both of the databases results in award of an incentive payment through an electronic payment means.
31. (Amended) A system according to Claim 1 any of claims 1 to 30, enabling the patient to define permissions or authorisations at the time of data collection, data transfer, data storage and data access.
32. (Amended) A system according to Claim 1 any of claims 1 to 31, wherein information from a remote datasource is made available to the network computer system.
33. A system according to claim 32, wherein said remote datasource comprises data relating to ambient environmental conditions.
34. A system according to claim 32, wherein the remote datasource comprises a database of prescribable medicaments.
35. (Amended) A system according to Claim 1 any of claims 1 to 34, wherein the patient electronic data collector further comprises a patient electronic data management system comprising

a memory for storage of data;  
a microprocessor for performing operations on said data; and  
a transmitter for transmitting a signal relating to the data or the outcome of an operation on the data.

36. A system according to claim 35, wherein said patient electronic data management system additionally comprises a geographic positioning system.
37. (Amended) A system according to Claim 35 either of claims 35 or 36, wherein the communicator enables two-way transfer of data between the network computer system and the patient electronic data management system.
38. (Amended) A system according to Claim 1 any of claims 1 to 37, additionally comprising an authorised user data communicator comprising an authorised user electronic data management system comprising

a memory for storage of data;  
a microprocessor for performing operations on said data; and  
a transmitter for transmitting a signal relating to the data or the outcome of an operation on the data; and

a communicator for communicating with an entrypoint to a network computer system to enable communication of data between the network computer system and the authorised user electronic data management system.
39. A system according to claim 38 for the remote assessment of a patient's medical condition and remote prescription therefor comprising

a first authorised user data communicator capable of communicating a prescription authorisation command to the network computer system; and

a second authorised user data communicator capable of receiving a prescription authorisation command from the network computer system.
40. (Amended) A system according to Claim 1 any of claims 1 to 39, wherein any communicator employs radiofrequency or optical signals.

41. (Amended) A system according to Claim 1 any of claims 1 to 40, wherein any communicator communicates with the network computer system via a gateway thereto.
42. (Amended) A system according to Claim 1 any of claims 1 to 40, wherein the communicator includes an embedded network server.
43. (Amended) A system according to Claim 1 any of claims 1 to 42, wherein the communicator communicates with the network computer system via a second communications device having telecommunications capability.
44. A system according to claim 43, wherein the telecommunications device comprises a cellular phone or pager.
45. (Amended) A system according to Claim 42 any of claims 42 to 44, wherein the communicator communicates with the second communications device using spread spectrum radiofrequency signals.
46. (Amended) A system according to Claim 1 any of claims 1 to 46, wherein the communicator communicates with a specifiable network address of the network computer system.
47. A system according to claim 46, wherein the specifiable network address is selected from the group consisting of a web-site address, an e-mail address and a file transfer protocol address.
48. (Amended) A system according to Claim 35 any of claims 35 to 47, wherein the patient electronic data management system additionally comprises a data input system for patient input of data to the electronic data management system.
49. A system according to claim 48, wherein said data input system comprises a man machine interface selected from a keypad, graphical user interface (GUI), voice recognition interface or biometrics interface.

50. (Amended) A system according to Claim 35 ~~any of claims 35 to 49~~, additionally comprising a display for display of data from the patient electronic data management system to the patient.
51. (Amended) A system according to Claim 1 ~~any of claims 1 to 50~~, wherein the plural patients have related respiratory conditions and each patient electronic data collector additionally comprises a sensor which senses the breath of a user, wherein the sensor communicates breath data to the patient electronic data collector.
52. A system according to claim 51, wherein said sensor comprises a breath-movable element which is movable in response to the breath of a patient.
53. A system according to claim 52, wherein said breath-movable element is selected from the group consisting of a vane, a sail, a piston and an impeller.
54. A system according to claim 52, wherein the sensor comprises a pressure sensor for sensing the pressure profile associated with the breath of a user.
55. A system according to claim 52, wherein the sensor comprises an airflow sensor for sensing the airflow profile associated with the breath of a user.
56. A system according to claim 52, wherein the sensor comprises a temperature sensor for sensing the temperature profile associated with the breath of a user.
57. A system according to claim 52, wherein the sensor comprises a moisture sensor for sensing the moisture profile associated with the breath of a user.
58. A system according to claim 52, wherein the sensor comprises a gas sensor for sensing the oxygen or carbon dioxide profile associated with the breath of a user.
59. (Amended) A system according to Claim 51 ~~any of claims 51 to 58~~, wherein said breath data includes breath cycle data.
60. ~~A system according to any of claims 51 to 58, wherein said breath data includes peak flow data.~~
60. (Amended) A system according to Claim 1 ~~any of claims 1 to 50~~, wherein the plural patients have related cardiovascular conditions and each patient electronic data collector additionally comprises a sensor which senses the cardiovascular

activity of a patient, wherein the sensor communicates cardiovascular data to the patient electronic data collector.

61. A system according to claim 60, wherein said sensor measures the blood pressure of the patient.

62. A method for collecting and providing selective user access to medical data relevant to plural patients having related medical conditions comprising locally collecting patient data relevant to each patient's medical condition in electronic form;

communicating with an entrypoint to a network computer system to enable transfer of said patient data to a first patient-specific database and to a second condition-specific database of said network computer system; and

permitting first authorised user access to the first patient-specific database via a first secure access gateway, and/or permitting second authorised user access to the second condition-specific database via a second secure access gateway.

63. A method according to claim 62, comprising collecting the data on a regular basis.

64. A method according to claim 62, comprising collecting the data on a continuous basis.

65. (Amended) A method according to Claim 62 any of claims 62 to 64, comprising communicating the data in encrypted form.

66. (Amended) A method according to Claim 62 any of claims 62 to 65, wherein the data is continuously communicable.

67. (Amended) A method according to Claim 62 any of claims 62 to 65, wherein the data is communicable in packet form.

68. (Amended) A method according to Claim 62 any of claims 62 to 67, comprising permitting different levels of access to the data to different authorised users.

69. (Amended) A method according to Claim 62 any of claims 62 to 68, additionally comprising

a first authorised user communicating a prescription authorisation command to the network computer system;

a second authorised user receiving said prescription authorisation command from the network computer system; and

said second authorised user preparing the prescription based on the prescription authorisation.

70. (Amended) A method according to Claim 62 ~~any of claims 62 to 68~~, additionally comprising

a first authorised user communicating a prescription authorisation command to a pharmacy network computer system;

a second authorised user receiving said prescription authorisation command from the pharmacy network computer system; and

said second authorised user preparing the prescription for the patient based on the prescription authorisation,

wherein the pharmacy network computer system is arranged for communication with the network computer system.

71. (Amended) A method according to Claim 69 ~~either of claims 69 or 70~~, wherein the first authorised user communicates the prescription authorisation in response to a 'update prescription' alerting signal visible at a patient-specific network address on the network computer system.

72. (Amended) A network computer system for use with the system according to Claim 1 ~~any of claims 1 to 61~~ comprising

an interface capable of receiving patient data in electronic form from plural patient electronic data collectors;

associated with said interface, a first patient-specific database and a second condition-specific database for storing said patient data; and

an authorised user inquiry system comprising either or both of

(a) a first secure access gateway permitting access to the first patient-specific database in response to a first user authorisation command;

first search means for searching said patient-specific database in response to a first authorised user inquiry; and

first results transmitting means for transmitting the results of said first authorised user inquiry to the first authorised user;

(b) a second secure access gateway permitting access to the second condition-specific database in response to a second user authorisation command;

second search means for searching said second condition-specific database in response to a second authorised user inquiry; and

second results transmitting means for transmitting the results of said second authorised user inquiry to the second authorised user,

wherein the patient data originates remotely from the network computer system.

73. Network computer system according to claim 72, wherein the network address comprises a web-site address or a file transfer protocol address.

74. A method for collecting and providing selective user access to medical data relevant to plural patients having related medical conditions, the method comprising

receiving data relevant to each patient's medical condition collected automatically at a plurality of locations;

storing some or all of the received data in a first, patient-specific database;

storing some or all of the received data in a second, condition-specific database;

allowing access to said first database in response to a first user authorisation command; and

allowing access to said second database in response to a second user authorisation command.

75. A method according to claim 74, wherein the data is received and access to the databases is allowed via a network using TCP/IP.

76. (Amended) A computer program comprising program means for, when executed on a computer, instructing the computer to perform all of the steps Claim 74 of either one of claims 74 or 75.

77. A computer program product comprising a computer readable recording medium having recorded thereon a computer program comprising code means for, when executed on a computer, instructing said computer to perform the steps of receiving data relevant to each patient's medical condition collected automatically at a plurality of locations;  
storing some or all of the received data in a first, patient-specific database;  
storing some or all of the received data in a second, condition-specific database;  
allowing access to said first database in response to a first user authorisation command; and  
allowing access to said second database in response to a second user authorisation command.

New Claim 78 was added:

--78. A system according to Claim 51, wherein said breath data includes peak flow data.--

Patient data monitoring system

5 The present invention relates to a system for the remote monitoring of the medical condition of plural patients. The system employs plural patient electronic data collectors, each for collecting patient data relevant to a particular patient's medical condition. Each patient electronic data collector is capable of communicating with an entrypoint to a network computer system.

10 It is common prescribing practice for a doctor to prescribe a patient with medicament in a medicament dispenser together with instructions for patient administration of the medicament according to a defined treatment regime. The patient typically therefore, receives instructions relating to the correct use of the dispenser together with recommended dosing amounts, dose intervals and treatment period. The patient is then trusted to follow the treatment regime as set by the doctor.

15 A limitation associated with this practice is that the treatment regime is set at the time of prescription and cannot therefore account for changes in the patient's condition over the treatment period. A further limitation associated with this practice is that the onus is on the patient to comply with the doctor's instructions. Occasionally, patients will forget to take the medicament or will vary the treatment regime in an unpredictable manner with possible consequences for the success of the treatment.

20 25 A variation on the above-described prescribing practice involves the use by a patient of a diagnostic device which enables data relating to their medical condition to be gathered on a regular basis. This data may for example, be collected prior to administration of any medicament and a correct dose amount calculated on the basis of the diagnostic data. An example of this practice would be that of a diabetic who checks their blood-sugar levels in order to calculate a required dose of insulin.

30 35 In developments of the practice variation, the diagnostic device may be integrated with the delivery system. Information relating to the patient's condition

and usage of the dispenser may thus be displayed to the patient to enable the better management of their medical condition. The information may further be stored in a memory such that it may be recalled at a later time to enable historic analysis of the progress of the condition and effect of the treatment. Dispensers employing electronic data management systems have been proposed for this purpose.

It is desirable to have a system which allows for the remote monitoring of the medical condition of plural patients having similar medical conditions and undergoing similar treatment or prescribing regimes. This monitoring would allow for an overview picture to be obtained of the degree and nature of patient compliance with the treatment or prescribing regime. The effectiveness of the treatment or prescribing regime in the group of patients may also be monitored over time. Where different sets of plural patients are undertaking different treatment or prescribing regimes the method would further enable cross-comparison of the effectiveness of the different regimes. It is further desirable that the system allows for selective access to the collected data. For example, the patient and their doctor may be allowed exclusive access to the individual patient data. Healthcare managers on the other hand may be enabled to view overview data, but not data relating to individuals.

The Applicants have now developed an improved system for remotely collecting and providing selective access to medical data relevant to plural patients having related medical conditions. The system employs plural electronic data collectors, each of which is assigned to a particular patient. Associated with each electronic data collector there is provided a communicator for communicating with an entrypoint to a remote network computer system to enable transfer of patient data thereto. The data is transferable to a first database which is specific to the patient and to a second database which is not patient-specific but is specific to the medical condition being monitored. The system enables different levels of security to be applied to access to each database. First and second secure access gateways are provided permitting access to the first and second databases in response to first and second user authorisation commands.

10  
15  
20

The system is configurable to allow selective access to the different databases depending upon the level of the user authorisation. The system can further be integrated with other medical information databases including medicament databases or systems for the provision of electronic prescriptions. In the latter case, the systems in combination enable seamless remote assessment or medical condition and prescription of medicament or variation of the prescription regime.

US-A-5,363,842 describes an inhalation device for use in delivering inhalable medicament. The device enables data relating to the patient's breathing pattern to be collected, analysed and displayed to the patient. The data is stored in a memory for download to a workstation at the clinic.

WO99/35588 describes a method for managing the administration of medicine and in particular, monitoring patient compliance with a prescribed treatment regime. The method relies on input of patient data to a central computer workstation. The central computer workstation calculates and transmits dosage data to a dispensing device via a communications link. The dispensing device delivers drug in accord with the dosage data.

According to one aspect of the present invention there is provided a system for collecting and providing selective access to medical data relevant to plural patients having related medical conditions comprising a network computer system; associated with the network computer system, a first patient-specific database and a second condition-specific database; remote from said network computer system, plural patient electronic data collectors, each for collecting patient data relevant to a particular patient's medical condition; associated with each patient electronic data collector, a communicator for communicating with an entrypoint to said network computer system to enable transfer of said patient data to said first patient-specific database and to said second condition-specific database; a first secure access gateway permitting access to the first patient-specific database in response to a first user authorisation command; and a second secure access gateway permitting access to the second condition-specific database in response to a second user authorisation command.

5

10

15

20

25

30

35

In one aspect, the patient electronic data collector collects patient data on a regular basis. In another aspect, the patient electronic data collector collects patient data on a continuous basis.

- 5 The patient data is relevant to the patient's medical condition. The data may therefore comprise diagnostic data which is of use in diagnosing the patient's ongoing condition. The data may also comprise compliance data which is of use in assessing a patient's compliance with a particular treatment or prescription regime. It will be appreciated, particularly in the light of the further description  
10 presented below, that in aspects herein the patient data may be selectively transferred to the first and second database such that not all patient data is necessarily transferred to both databases.

10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

The system is of most application where the plural patients have related medical conditions. This is also likely to mean that similar or at least related diagnostic data will be collected from each patient. The patients may also be on similar, related or identical treatment or prescribing regimes. Cross-comparison of the effectiveness of different treatment or prescribing regimes may be undertaken. The system may also be employed in a clinical trial situation wherein the prescription regime for at least some of the patients involves the use of a placebo.

- 25 The patient electronic data collectors are physically, and potentially geographically distant from the entrypoint to the network computer system. It is envisaged that the each electronic data collector will be kept under the control of an individual patient. In embodiments, the data collector may be worn by the patient or be a handheld device carried by the patient. Examples of patient-wearable devices would include belt attachable devices, devices in the form of watches for wrist or leg attachment and devices attachable as jewellery. Suitable  
30 body attachment means will be incorporated as required.

Any patient electronic data collector may in a preferred aspect be integrated with a system for the delivery of medicament. The medicament delivery system will typically comprise a medicament container and a dispensing mechanism for

dispensing medicament from the medicament container. The system may be arranged to collect data when the patient uses the medicament delivery system.

In one aspect, the medicament delivery system provides respirable delivery of medicament to the patient. In another aspect, the medicament delivery system provides injectable delivery of medicament to the patient.

In one aspect the medicament delivery system and electronic data collector are comprised within a handheld device. In another aspect, the medicament delivery system is an implant in the body of the patient.

Suitably, the medicament delivery system includes a predictive algorithm or look-up table for calculating the optimum amount of medicament to dispense. Suitably, the medicament delivery system has a memory including a dose memory for storing dosage data and reference is made to the dose memory in calculating the optimum amount of medicament to dispense.

Suitably, the system additionally comprises a selector for selecting the amount of medicament to dispense from a medicament dispensing mechanism. The selector may thus be employed to vary the medicament dose for dispensing from the dispensing mechanism.

In one aspect, the selector is manually operable.

In another aspect, the selector is operable in response to a signal from the transmitter.

Suitably, the selector comprises a timing mechanism for varying the time interval of actuation of the dispensing mechanism.

Alternatively, the selector comprises a metering mechanism between the medicament container and the dispensing mechanism for metering a variable quantity of medicament for dispensing.

Alternatively, the selector comprises a multiple-fire mechanism for multiple actuation of the dispensing mechanism, wherein each actuation releases a portion of the optimum amount of medicament. Successive actuations may be pulsed, for example such that the time intervals between actuations may be based on arithmetic or geometric progressions.

Suitably, the system additionally comprises a detector for detecting dispensing from the medicament container, wherein said detector communicates dispensing data to the electronic data management system.

Suitably, the communicator is local to the patient, for example being integral with the patient data collector, or within another handheld device or present in the home or working environment of the patient. The communicator may for example, be comprised within a device which is mechanically coupled to the patient data collector by any suitable mechanical mechanism including grip mechanisms and snap-fit mechanisms. In a preferred aspect, the data communicator forms a snap-in module and the patient data collector is shaped for receipt of the module.

In one preferred aspect, the communicator communicates wirelessly with the entrypoint to the network computer system.

The patient data typically includes a patient identifier. The identifier may be freely readable or it may be masked to ensure patient anonymity.

Suitably, the data is communicable between the patient electronic data collector and the network computer system in encrypted form. All suitable methods of encryption or partial encryption are envisaged. Password protection may also be employed.

In one aspect, the patient data is continuously communicable between the patient electronic data collector and the network computer system. In another aspect, the patient data is communicable in packet form between the patient electronic data collector and the network computer system.

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22

25

30

35

The network computer system may in aspects comprise a single server or it may comprise plural servers arranged for communication with each other. In one aspect, the network computer system comprises a public access network computer system. The Internet is one suitable example of a public access

5 network computer system, wherein the entrypoint can be any suitable entrypoint thereto including gateways managed by an Internet service provider. The public access network computer system may also form part of a telecommunications system, which may itself be either a traditional copper wire system, a cellular system or an optical or microwave network.

10 In another aspect, the network computer system comprises a private access network computer system and the entrypoint is a secure gateway. The private access network system may for example, comprise an Intranet or Extranet which is maintained by a private organisation.

15 The network computer system is typically located at or under the control of a specialist healthcare data manager. The data manager may for example be associated with a healthcare provider or manager such as a doctor's practice, a hospital, a healthcare management centre or a pharmaceutical company. It is an advantage of the system herein, that the network computer system may be  
20 located geographically distant from the patient.

25 The first database comprises medical condition data which is specific to a particular patient. It will thus be appreciated that over a period of time various sets of data will be transferred from the patient electronic data collector to the first database. The first database may therefore be used to track the condition of the patient and their compliance with any treatment regime over a period of time.

30 The second database is a collective database comprising medical condition data which relates to plural patients. It will thus be appreciated that over a period of time various sets of data relating to each of the plural patients will be transferred from each of the patient electronic data collectors to the second database. The data may be masked such that it is not directly relatable to any particular patient source. The second database may therefore be used to track the condition of

the plural patients and their compliance with any treatment regime over the period of time.

5 The first and second databases may be arranged to be entirely separate from each other. Alternatively, the first database specific to each patient may be arranged to comprise a sub-database of the larger second database. Hybrids of these two alternatives are also envisaged.

10 The data within any of the databases may be partitioned in any suitable way.

10 The partitioning may for example, reflect a patient's request that certain information is kept confidential whereas other information is made more generally available. Segments of any database may be arranged to require special security access or indeed be maskable. The masking may occur at the time of data collection such that only certain of the collected data are transferred to any of the databases. The partitioning may also be arranged for commercial reasons. Commercial partitioning may for example be arranged to reflect a pricing structure for access to the databases, or to protect commercial confidentiality.

20 Access to the databases herein will typically be achieved by the user initially accessing a web-site from which the databases may be accessed through the secure gateways. The initial web-site may be a general public access site, but more usefully the site may be tailored to meet the user's needs. For example, if the user is a patient the initial web-site may comprise links to other sites of interest to the patient or to patient chat rooms. Alternatively, if the user is a healthcare professional links may be provided to the sites of professional interest groups.

25 The first secure access gateway permits access to the first patient-specific database in response to a first user authorisation command. The second secure access gateway permits access to the second condition-specific database in response to a second user authorisation command. The first and second secure access gateways may be arranged to be entirely distinct from each other. Alternatively, the first and second secure access gateways may be coupled or arranged in a series fashion. A further secure access gateway may

additionally be provided through which access a user must first gain access in order to gain access to the first and second secure access gateways.

The secure gateways will typically provide password protection and the different user authorisation commands will take the form of different passwords. The gateways or any other part of the system may also incorporate a firewall or suitable encryption means.

The first and second user authorisation commands will usually be distinct, but embodiments can be envisaged when a single authorisation command gains access through both gateways.

Suitably, the authorised users are selected from the group consisting of the patient, a healthcare professional such as a doctor or nurse, a pharmacist, an emergency assistance provider, a research professional, a database manager and any combinations thereof.

Suitably, the first and second secure access gateways allow for different levels of access authorisation to the first and second databases to be assigned to different authorised users.

The users that are provided access rights to the first and second databases will probably be different but members of the user groups may overlap. The first database clearly contains information which may be sensitive to the patient and user access may thus be restricted to just the patient and their doctor. The second database contains information which may provide an overview of the effectiveness of a particular treatment regime. This information may be medically, or even commercially, sensitive and user access may be accordingly restricted.

Embodiments are envisaged in which access to either one or both of the databases involves payment of a fee or is rewarded by an incentive. For example, to encourage participation in the data collection the patient may receive a small payment each time data is communicated to the first database.

Alternatively, a commercial access fee may be charged for access to the second

database and that fee may be varied depending on the nature, volume and commercial value of the data accessed. Any fees or incentives are deductible or awardable by electronic means.

- 5 The user authorisation commands may be issued to groups of users having shared interests of forming alliances of interest groups. Patient groups may thus be given group access rights or similarly practitioner groups may be given group user authorisations. Any suitable groupings or alliances are envisaged arranged along any suitable lines including patient groups, professional groups or commercial alliances.

10  
15  
20  
The system is arranged to allow selective monitoring and access to data. A key part of the system is that it enables patient preferences to be reflected via the use of patient permissions and authorisations. Permission steps may therefore be introduced at the time of data collection, data transfer, data storage and data access. The permissions may be arranged to be alterable on request of the patient. The system may also be configured to accommodate situations where the patient waives their right to control of the collected data by contractual arrangement with the administrators of the system.

25  
Suitably, information from a remote datasource (i.e remote from the network and/or remote from the patient) is made available to the user at the initial point of access to the network computer system. The information may be historic or it may be updated regularly or even be provided in real-time.

25  
In one aspect, the remote datasource comprises data relating to ambient environmental conditions such as weather conditions, or pollution, smog and pollen levels.

- 30  
In another aspect, the remote datasource comprises a database of prescribable medicaments. The database may be arranged to focus on medicaments of particular applicability to the patient's condition and to be the subject of regular update as new medicaments are released to the market.

The remote datasource may, for example be managed by a medicament prescriber, for example a doctor's practice. Information transferred from the medicament prescriber may thus, comprise changes to prescription details, automatic prescription updates or training information.

5

In another aspect, the remote datasource is managed by a pharmacy. Information transferred from the pharmacy may thus, comprise information relating to the medicament product.

10

In a further aspect, the remote datasource is a manufacturer of medicament or medicament delivery systems. Information transferred to the system may thus, comprise product update information.

15

In a further aspect, the remote datasource is a research establishment. In a clinical trial situation, information may thus be transferred relating to the trial protocol.

20

Suitably, the patient electronic data collector further comprises a patient electronic data management system comprising a memory for storage of data; a microprocessor for performing operations on said data; and a transmitter for transmitting a signal relating to the data or the outcome of an operation on the data. The memory may comprise a non-volatile memory chip (e.g. an EEPROM or a FLASH memory chip) which is capable of storing data when the electronic data collector is turned off.

25

Suitably, the patient electronic data management system additionally comprises a geographic positioning system such as a global positioning system or a system which relies on the use of multiple communications signals and a triangulation algorithm.

30

Either the network computer system or the communicator may initiate data transfer. Suitably, the communicator enables two-way transfer of data between the network computer system and the patient electronic data management system.

35

Suitably, the system additionally comprises an authorised user (i.e. other than the patient) data communicator comprising an authorised user electronic data management system comprising a memory for storage of data; a microprocessor for performing operations on said data; and a transmitter for transmitting a signal relating to the data or the outcome of an operation on the data; and a communicator for communicating, preferably wirelessly, with an entrypoint to a network computer system to enable communication of data between the network computer system and the authorised user electronic data management system.

The system herein may be integrated with a system for electronic prescribing. Thus, according to another aspect of the present invention there is provided a system for the remote assessment of a patient medical conditions and remote prescription therefor comprising a system as described above and additionally a first authorised user (e.g. a prescriber) data communicator capable of communicating a prescription authorisation command to the network computer system; and a second authorised user (e.g. a pharmacist) data communicator capable of receiving a prescription authorisation command from the network computer system.

Suitably, any communicator employs radiofrequency or optical (e.g. infra red or ultraviolet) signals.

In one aspect, any communicator communicates with the network computer system via a gateway thereto. Communication will typically involve the use of a suitable communications protocol.

In another aspect, the system (device) is provided with an embedded network server to enable it to be comprised directly within the network system, typically using IP protocol. The embedded network server will have hardware and software components and for example comprise an HTTP (web) server, an FTP (file) server or an SMTP (mail) server. The embedded network server will typically be provided with a unique network address such as a web-site address, an e-mail address or a file transfer protocol address. The so-enabled system (device) may also have the capability to form local area networks with other

similarly enabled systems (devices) to enable local transfer of data therebetween.

Suitably, the communicator communicates with network computer system via a second communications device. The second communications device may itself comprise an embedded web server. Preferably, the second communications device is a telecommunications device, more preferably a cellular phone or pager. Preferably, the communicator communicates with the second communications device using spread spectrum radiofrequency signals. A suitable spread spectrum protocol is the Bluetooth (trade mark) standard which employs rapid (e.g. 1600 times a second) hopping between plural frequencies (e.g. 79 different frequencies). The protocol may further employ multiple sending of data bits (e.g. sending in triplicate) to reduce the effect of interference.

In another aspect, the communicator communicates with the second communications device using an infra red data communications standard (e.g. IrDA).

In one aspect, the network computer system comprises a public access network computer system. The Internet is one suitable example of a public access network computer system, wherein the entrypoint thereto is typically managed by an Internet service provider. The public access network computer system may also form part of a telecommunications system, which may itself be either a traditional copper wire system, a cellular system or an optical or microwave network.

In another aspect, the network computer system comprises a private access network computer system typically comprising a private entrypoint system. The private access network system may for example, comprise an intranet or extranet which may for example, be maintained by a health service provider or medicament manufacturer. The private access network system may for example include password protection; a firewall; and suitable encryption means.

Suitably, the patient electronic data management system additionally comprises a datalink for linking to a local data store such as a personal computer or set-top

box to enable communication of data between the local data store and the microprocessor. Preferably, the datalink comprises an infrared emitter and sensor.

5 Suitably, the patient electronic data management system additionally comprises a data input system for user input of data to the electronic data management system. More preferably, the data input system comprises a man machine interface preferably selected from a keypad, voice recognition interface, graphical user interface (GUI) or biometrics interface.

10 Suitably, the patient electronic data management system additionally comprises a display for display of data from the electronic data management system to the user. The display may for example, comprise a screen such as an LED or LCD screen.

15 In one aspect, the system is suitable for the remote assessment of plural patients' respiratory conditions and each patient electronic data collector additionally comprises a sensor which senses the breath of a user, wherein the sensor communicates breath data to the patient electronic data collector.

20 Suitably, the sensor comprises a breath-movable element which is movable in response to the breath of a patient. Preferably, the breath-movable element is selected from the group consisting of a vane, a sail, a piston and an impeller.

25 In another aspect, the sensor comprises a pressure sensor for sensing the pressure profile associated with the breath of a user.

30 In a further aspect, the sensor comprises an airflow sensor for sensing the airflow profile associated with the breath of a user.

In a further aspect, the sensor comprises a temperature sensor for sensing the temperature profile associated with the breath of a user. The temperature of the inhaled and exhaled part of the breath cycle varies and may, thus, be used as a measurement tool.

In a further aspect, the sensor comprises a moisture sensor for sensing the moisture profile associated with the breath of a user. The moisture content of the inhaled and exhaled part of the breath cycle varies and this also may be used as a measurement tool.

5

In a further aspect, the sensor comprises a gas sensor for sensing the oxygen or carbon dioxide profile associated with the breath of a user. The chemical profile of the inhaled and exhaled part of the breath cycle varies and this further may be used as a measurement tool.

10

Suitably, the breath data includes breath cycle data or peak flow data.

15

In one aspect, the system is suitable for the delivery of respirable medicament and additionally comprises a sensor which senses the breath of a user, wherein the sensor communicates breath data to the electronic data management system.

20

Suitably, the system additionally comprises an actuator for actuating the dispensing mechanism, said actuator being actuatable in response to a trigger signal from the transmitter.

25

Suitably, the electronic data management system includes a predictive algorithm or look-up table for deriving from the breath data when to transmit the trigger signal. For example, a real-time analysis of the patient breath waveform may be made and the trigger point derived by reference to that analysed waveform.

30

Suitably, the memory includes a dose memory for storing dosage data and reference is made to the dose memory in calculating the optimum amount of medicament to dispense.

Suitably, the system additionally comprises a detector for detecting dispensing from the medicament container, wherein said detector communicates dispensing data to the patient electronic data management system.

In one preferred aspect, the medicament container is an aerosol container and the dispensing mechanism is an aerosol valve.

5 In another preferred aspect, the medicament container is a dry-powder container, that is to say a container suitable for containing medicament in dry-powder form.

Suitably, the actuator comprises an energy store for storing energy which energy is releasable to actuate the dispensing mechanism of the medicament container.

10 The energy store comprises in preferred aspects, a biasable resilient member such as a spring, a source of compressed fluid such as a canister of compressed gas or a battery. Chemical energy sources are also suitable and might include chemical propellant or ignition mixtures. Other sources might include physical explosives such as liquefied or solidified gas in a canister which burst when heated or exposed to the atmosphere.

15  
20  
25  
The system may additionally comprise a safety mechanism to prevent unintended multiple actuations of the actuator. The patient is thereby protected from inadvertently receiving multiple doses of medicament in a situation where they take a number of short rapid breaths. More preferably, the safety mechanism imposes a time delay between successive actuations of the actuator. The time delay is typically of the order of from three to thirty seconds.

An actuation counter which can be mechanical or electronic may be provided to the system.

25  
30 A medicament dispensing counter, such as a dose counter, may be provided to the system. This may be mechanical or electronic. The counter may be coupled to a visual display to provide feedback to the patient as to amount of drug released or remaining in the container.

A manual override can be provided to the system for use in the event of emergency or system failure.

In another aspect, the system is suitable for the remote assessment of a plural patient's cardiovascular condition and each patient electronic data collector additionally comprises a sensor which senses the cardiovascular activity of a patient, wherein the sensor communicates cardiovascular data to the patient electronic data collector. Preferably, the sensor measures the blood pressure of the patient.

According to another aspect of the present invention there is provided a method for collecting and providing selective user access to medical data relevant to plural patients having related medical conditions comprising locally collecting patient data relevant to each patient's medical condition in electronic form; communicating with an entrypoint to said network computer system to enable transfer of said patient data to a first patient-specific database and to a second condition-specific database of said network computer system; and permitting first authorised user access to the first patient-specific database via a first secure access gateway, and/or permitting second authorised user access to the second condition-specific database via a second secure access gateway.

Suitably, the method comprises collecting the data on a regular basis.

Suitably, the method comprises collecting the data on a continuous basis.

Suitably, the method comprises communicating, preferably wirelessly, the data in encrypted form.

In one aspect, the data is continuously communicable. In another aspect, the data is communicable in packet form.

Suitably, the method comprises permitting different levels of access to the data to different authorised users.

In one aspect the method is suitable for remotely assessing a patient's condition and remotely prescribing therefor and additionally comprises a first authorised user communicating a prescription authorisation command to the network computer system; a second authorised user receiving said prescription

authorisation command from the network computer system; and said second authorised user preparing the prescription based on the prescription authorisation.

5 In another aspect, the method is suitable for remotely assessing a patient's condition and remotely prescribing therefor and additionally comprises a first authorised user (e.g. a doctor) communicating a prescription authorisation command to a pharmacy network computer system; a second authorised user (e.g. a pharmacist) receiving said prescription authorisation command from the pharmacy network computer system; and said second authorised user preparing the prescription for the patient based on the prescription authorisation. The pharmacy network computer system is arranged for communication with the network computer system.

10 15 Suitably, the first authorised user communicates the prescription authorisation in response to a 'update prescription' alerting signal visible at a patient-specific network address. The 'update prescription' signal is typically based on data communicated from the patient data collector which may for example, reflect a change in the patient's condition. In one aspect, where the patient data collector forms part of a medicament delivery system the 'update prescription' signal may be an alert that the levels of medicament in the delivery system are running low and that a re-prescription is needed.

20 25 According to a further aspect of the present invention there is provided a network computer system for use with the remote assessment system described above comprising an interface capable of receiving patient data in electronic form; associated with said interface, a first patient-specific database and a second condition-specific database for storing said patient data; and an authorised user inquiry system comprising either or both of

30 35 (a) a first secure access gateway permitting access to the first patient-specific database in response to a first user authorisation command; first search means for searching said patient-specific database in response to a first authorised user inquiry; and first results transmitting means for transmitting the results of said first authorised user inquiry to the first authorised user;

(b) a second secure access gateway permitting access to the second condition-specific database in response to a second user authorisation command; second search means for searching said second condition-specific database in response to a second authorised user inquiry; and second results transmitting means for transmitting the results of said second authorised user inquiry to the second authorised user.

The patient data originates remotely from the network computer system.

Suitably, the data is received at a patient-specific network address, which may be permanently assigned or dynamically assigned on a temporary basis. The network address comprises a web-site address or a file transfer protocol address or other suitable web-hub on a public access network computer system such as the Internet, or a private access network computer system such as an Extranet or Intranet. The patient data arises from a patient data collector local to the patient and in wireless communication with an entrypoint to the network computer system. The authorised user inquiry originates from any suitable authorised user. The system may be configured to allow for selective access to the patient database dependent upon level of user authorisation.

According to a further aspect of the present invention, there is provided a method for collecting and providing selective user access to medical data relevant to plural patients having related medical conditions, the method comprising receiving data relevant to each patient's medical condition collected automatically at a plurality of locations; storing some or all of the received data in a first, patient-specific database; storing some or all of the received data in a second, condition-specific database; allowing access to said first database in response to a first user authorisation command; and allowing access to said second database in response to a second user authorisation command.

According to a further aspect of the present invention, the method described above may be implemented in the form of computer software. The software may comprise a computer program comprising program code means for, when executed on a computer, instructing a computer to perform all of the steps of the

method. The software may also comprise a computer program product comprising a computer readable recording medium having recorded thereon a computer program comprising code means for, when executed on a computer, instructing said computer to perform the steps of the method.

5

Embodiments of systems according to the invention will now be described with reference to the accompanying drawings in which:

Figure 1. is a schematic representation of a first system in accord with the present invention in which a patient electronic data collector forms part of a medicament delivery system;

Figure 2. is a schematic representation of a second system in accord with the present invention in which a patient electronic data collector forms part of a medicament delivery system;

Figures 3 and 4 are schematic representations of third and fourth systems in accord with the present invention in which the patient remote assessment system integrates with a system for electronic prescription of medicament;

20

Figure 5. is a system diagram of a third system in accord with the present invention;

25

Figure 6. is a system diagram of a central controller unit for use in accord with the present invention;

Figures 7. and 8. are schematic diagrams of first and second database structures for use in accord with the present invention;

30

Figure 9. is a system diagram of a patient electronic data manager for use in accord with the present invention;

Figure 10. is a flow diagram illustrating the steps of data collection and data communication to the network in accord with the present invention; and

35

Figure 11. is a flow diagram illustrating the steps of data access at the network in accord with the present invention.

Figures 1 and 2 show representative parts of systems herein in which the patient electronic data collector is comprised within a metered dose inhaler 10 (or 110) for the delivery of inhalable medicament. The inhaler 10 (or 110) is provided with communication means 40 (or 140) to enable communication with a network computer system 50 (or 150). It will be appreciated that the full system will comprise plural such patient electronic data collectors. It will also be appreciated that the network computer system will have a defined data structure as will become apparent when reference is made to later Figures presented herein.

Referring to Figure 1 in more detail, the inhaler comprises a tubular housing 10 in which an aerosol container 12 is located. The housing is open at one end (which will hereinafter be considered to be the top of the device for convenience of description) and is closed at the other. A dispensing outlet 14 leads laterally from the closed end of the housing 10. In the embodiment illustrated, the outlet 14 is in the form of a mouthpiece intended for insertion into the mouth of the patient but it may, if desired, be designed as a nozzle for insertion into the patient's nostril.

The aerosol container 12 is located in the housing 10 so that one end protrudes from the open top of the housing 10. The aerosol container 12 has an outlet valve stem (not visible) at one end which connects with a support (not shown) in the housing 10. To dispense the dose, the protruding portion of the aerosol container 12 is depressed to move the container 12 relative to the valve stem to open the valve and dispense medicament into the outlet 14 from which it can be inhaled by a patient.

The dispenser includes an electronic data management system in the form of an integrated circuit preferably integrated into one or more integrated circuit chips and comprised within the housing (not visible). The user may access the electronic data management system by use of push-buttons 20 and toggle menu-button 24. Display 30 allows for display of menu choices and data from the electronic data management system. The dispenser communicates via

communications transceiver 40 to network computer system 50. The network computer system 50 comprises a secure network computer system which will typically be under the control of a healthcare data manager. Remote information sources 60, 62, 64, 66, 68 also have access to the network. In more detail, the  
5 remote information sources comprise a medicament prescriber 60, a pharmacy 62, a weather monitoring station 64, a pollution monitoring station 66 and a medicament manufacturer 68. Two-way data transfer is possible between the electronic data management system and the network computer system 50 via the communications transceiver 40. Information transfer is thus possible  
10 between the electronic data management system and any of the remote information sources 60, 62, 64, 66, 68. Information received from any of the remote information sources 60, 62, 64, 66, 68 may be utilised by the electronic data management system to vary the recommended medicament dose for delivery to the patient.

15 Figure 2. shows a variation of the system of Figure 1. The system comprises standard-form metered dose inhaler for the delivery of inhalable medicament comprising tubular housing 110, an aerosol container 112 and dispensing outlet 114. Operation of the inhaler is as described above with reference to Figure 1.  
20

25 The dispenser includes an electronic data management and communications system 140 comprised within the housing 110. Display 130 allows for limited display data from the electronic data management system. The dispenser readily communicates via communications system 140 to palmtop computer 170. The communication is via spread spectrum radiofrequency signals operable over a relatively short range (e.g. up to ten metres). The palmtop computer 170 has a more sophisticated display 172 including a graphical user interface comprising menu-entry screens from which selections may be made using toggle menu-button 174.

30 The patient accesses the electronic data management system 140 of the dispenser through the palmtop computer 170. The palmtop computer 170 itself can communicate through a telecommunications link with network computer system 150. The network computer system 150 comprises a secure Extranet computer system. As in Figure 1, remote information sources may also have  
35

access to the Extranet. Two-way data transfer is possible between the electronic data management system and the network computer system 150 via the communications links with the palmtop computer 170. Information transfer is thus possible between the electronic data management system 140, palmtop computer 170 and any of the remote information sources.

Figure 3 shows a system herein in which patient electronic data collector 240 communicates wirelessly with geographically distant network computer system 250. The network computer system 250 is itself accessible by the system of a medicament prescriber 260 (e.g. a doctor's surgery system) and by the system of a pharmacist 262.

Figures 3 and 4 show representative parts of systems herein in which the patient electronic data collector is shown schematically. It will be appreciated that the full system will comprise plural such patient electronic data collectors. It will also be appreciated that the network computer system will have a particular arrangement and structure as will become apparent when reference is made to later Figures presented herein.

The system of Figure 3 may be employed in the remote assessment of a patient and electronic prescribing therefor as follows. The patient data collector 240 communicates data relating to the medical condition of the patient to the network computer system 250. The medicament prescriber 260 accesses this data e.g. by use of a palmtop communications and data management device and makes a judgement as to prescription needs. If a new prescription is needed the prescriber sends a 'prescription authorisation' signal to the network computer system 250. The pharmacist 262 then accesses the network computer system to receive the 'prescription authorisation' signal which authorises them to make up the prescription for the patient.

The system of Figure 4 is a variation of the system of Figure 3 in which patient electronic data collector 340 communicates wirelessly with geographically distant network computer system 350. The network computer system 350 is itself accessible by the system of a medicament prescriber 360 (e.g. a doctor's surgery system). The prescriber system 360 may also access second network

computer system 354 which is accessible by the system of a pharmacist 362. In an alternative herein, the second computer system 354 may be integral with the system of the pharmacist 362 or be a dedicated secure prescription system accessible only to the prescriber and the pharmacist.

5

The system of Figure 4 is employed in the remote assessment of a patient and electronic prescribing therefor as follows. The patient data collector 340 communicates data relating to the medical condition of the patient to the network computer system 350. The medicament prescriber 360 accesses this data and makes a judgement as to prescription needs. If a new prescription is needed the prescriber sends a 'prescription authorisation' signal to the second network computer system 354. The pharmacist 362 then accesses the network computer system to receive the 'prescription authorisation' signal which authorises the pharmacist to make up the prescription for the patient.

10  
15  
20  
25

Figure 5. shows a representative system herein comprising plural patient electronic data collectors 440a-c, each of which would be under the control of a different patient. Associated with each patient electronic data collector 440a-c there is a patient communicator 442a-c (e.g. a modem) which is capable of communication with a network computer system 450. The system also comprises an authorised user interface 480 having associated authorised user communicator 482 which is capable of communicating with the network computer system 450. Central controller unit 490 is in two-way communication with the network computer system 450.

25

The system of Figure 5. is shown in patient 'data upload mode' wherein patient data 444a-c is being communicated to the network. It may be appreciated that any patient can also communicate requests for data to the network 450 and receive responses thereto via the patient communicator 442a-c. The system is also shown in authorised user 'enquiry mode' in which a database enquiry 484 is communicated to the network computer system 450 and a response received 486 via the authorised user communicator 482 to the authorised user interface 480.

Figure 6. shows the structure of the central controller 590 in more detail. The central controller includes a data storage device 591, central processor (CPU) 592, cryptographic processor 593, RAM 594, ROM 595, payment processor 596, operating system 597 and billing processor 598.

5

The components of the central controller 590 must be selected to be capable of handling sufficiently large volumes of data. The data storage devices, processors and operating system and other components may be selected from those commercially available.

10

The data storage device 591 is partitioned to include plural databases. The databases comprise a patient data database 548 which comprises diagnostic or compliance data communicated from any patient electronic data collector; a patient database 549 which includes patient details such as name, address and possibly medical history; an authorised user database 589 which includes details of authorised users of the system; a billing database 561 for billing authorised users on retrieval of data; a payment database 563 for payment of patients or other authorised users in return for data provided; and a crypto key database 565 comprising encryption information.

15

It will be appreciated that various parts of the system are designed to co-operate with each other in use. For example, the cryptographic processor 593 will access the crypto key database 565 to enable performance of user authentication. Together these crypto elements may form a secure access gateway to the patient data database.

25

As shown in Figure 6, the patient data database comprises a single database, but the database will usually be either partitioned as shown in Figure 7 or comprise two distinct databases as shown in Figure 8. Access to the patient data will be restricted according to level of access authorisation. In general, the patient and possibly their doctor will be allowed access to patient-specific data and personal details. Other authorised users will be permitted access to non-personal condition-specific data which provides an overview of the medical condition of the patients whose data is comprised therein.

30

35

In more detail, Figure 7 shows a single database comprising data relating to plural patients. The database is partitioned into a patient condition database 601a-n which comprises patient data relating to medical condition which has been collected from each patient, and a patient personal data database 602a-n which comprises patient personal data including medical history data. Different levels of user authorisation may be established to allow different users to access each part of the partitioned database.

Also in more detail, Figure 8 shows a different database structure. The first part of the database structure comprises plural patient condition and personal data databases 601a-n which comprises patient data relating to medical condition which has been collected from each patient and patient personal data. The second part of the database structure comprises patient data relating to medical condition which has been collected from each patient but with no patient identification or medical history details. Again different levels of user authorisation may be established to allow different users to access each part of the database structure.

Figure 9 shows a patient electronic data collector 810 comprised with a respiratory drug delivery system (not shown). The electronic data collector 810 comprises a central processor unit (CPU) 821; RAM 822; ROM 823 and a cryptographic processor 824. The CPU 821 receives patient data from sensor 815 which may for example be a breath sensor or a sensor detecting actuation of the drug delivery system. The received data is storables in data storage device 825 which includes two databases, one for storage of patient medical data 826 and one for storage of personal patient data 828. The CPU 821 is associated with man machine interface 820 for receipt of patient input commands and display driver 832 and display 830 for display of information to the patient. The CPU 821 is further associated with communications port 840 which links via modem 842 to the central controller 890 of a network computer system (not shown).

It will be appreciated that the basic structure of the patient electronic data collector 810 of Figure 9 can act as an authorised data communicator for making enquiry requests to the databases on the network computer system and

receiving responses therefrom. It will also be appreciated that the structure of the patient electronic data collector could be adapted by removal of the sensor 815 to form a non-patient authorised data communicator which would not be comprised within a drug delivery system.

5

In the flow diagram of Figure 10, the steps involved in a typical data collection and upload procedure are illustrated. Initially a patient activates 902 a data collector system which is located on a respiratory drug delivery system (as in Figure 1). The patient inhales through the mouthpiece 904 and a breath sensor collects data 906 relating to the patient's breath. The patient then actuates the system for drug delivery 908. Actuation may be manually actuated or it may be actuated in response to the patient's inhalation through the mouthpiece 904. An actuation sensor collects actuation data 910, for example relating to the time of actuation and type of drug delivered. The breath and actuation data is collected and processed by an electronic data manager 912. Either automatically, or in response to a request by the patient the communicator dials into the patient network address on the network computer system 912. Before access is permitted user authentication checks 916 are undertaken typically involving a password login. Once access is granted the data is communicated to the network address 918. Once data upload is completed the communications link is closed 920.

10

15

20

25

30

35

In the flow diagram of Figure 10, the steps involved in a typical data search and review procedure are illustrated. Following activation by an authorised user 1022, a communicator dials into the network computer system 1024. Before access is permitted user authentication checks 1026 are undertaken typically involving a password login procedure. A database search menu interface is presented to the authorised user 1028. The choices of database presented by the search menu to the user will depend upon the level of user authorisation. Search parameters are selected 1030 and a search of the patient database undertaken 1032. A check step is undertaken to check if the authorised user is permitted to download search data for offline review 1034. If download is permitted, the results of the search are communicated to the authorised user 1036 for analysis offline. If download of search data is not permitted the system enables online review of the data at the network address 1040. Further searches

may be undertaken if desired. Following either data download or online review of the search data the user indicates an intention to exit the system by closing the communications link 1044. Prior to exit of the system an electronic billing request is transmitted to the user 1042. Payment may either occur instantaneously by deduction of funds from the authorised user's account or payment may become due at a later date.

The medicament delivery system aspect of the invention is in one aspect suitable for dispensing medicament for the treatment of respiratory disorders such as disorders of the lungs and bronchial tracts including asthma and chronic obstructive pulmonary disorder (COPD).

Appropriate medicaments may thus be selected from, for example, analgesics, e.g., codeine, dihydromorphine, ergotamine, fentanyl or morphine; anginal preparations, e.g., diltiazem; antiallergics, e.g., cromoglycate (eg as the sodium salt), ketotifen or nedocromil (eg as the sodium salt); antiinfectives e.g., cephalosporins, penicillins, streptomycin, sulphonamides, tetracyclines and pentamidine; antihistamines, e.g., methapyrilene; anti- inflammatories, e.g., beclomethasone (eg as the dipropionate ester), fluticasone (eg as the propionate ester), flunisolide, budesonide, rofleponide, mometasone eg as the furoate ester), ciclesonide, triamcinolone (eg as the acetonide) or 6 $\alpha$ , 9 $\alpha$ -difluoro-11 $\beta$ -hydroxy-16 $\alpha$ -methyl-3-oxo-17 $\alpha$ -propionyloxy-androsta-1,4-diene-17 $\beta$ -carbothioic acid S-(2-oxo-tetrahydro-furan-3-yl) ester; antitussives, e.g., noscapine; bronchodilators, e.g., albuterol (eg as free base or sulphate), salmeterol (eg as xinafoate), ephedrine, adrenaline, fenoterol (eg as hydrobromide), formoterol (eg as fumarate), isoprenaline, metaproterenol, phenylephrine, phenylpropanolamine, pirbuterol (eg as acetate), reproterol (eg as hydrochloride), rimiterol, terbutaline (eg as sulphate), isoetharine, tulobuterol or 4-hydroxy-7-[2-[[2-[[3-(2-phenylethoxy)propyl]sulfonyl]ethyl]amino]ethyl]-2(3H)-benzothiazolone; adenosine 2a agonists, e.g. 2R,3R,4S,5R)-2-[6-Amino-2-(1S-hydroxymethyl-2-phenyl-ethylamino)-purin-9-yl]-5-(2-ethyl-2H-tetrazol-5-yl)-tetrahydro-furan-3,4-diol (e.g. as maleate);  $\alpha_4$  integrin inhibitors eg (2S)-3-[4-(4-

(aminocarbonyl)-1-piperidinyl]carbonyl]oxy)phenyl]-2-[((2S)-4-methyl-2-{{[2-(2-methylphenoxy) acetyl]amino}pentanoyl)amino] propanoic acid (e.g as free acid or potassium salt), diuretics, e.g., amiloride; anticholinergics, e.g., ipratropium (eg as bromide), tiotropium, atropine or oxitropium; hormones, e.g., cortisone, hydrocortisone or prednisolone; xanthines, e.g., aminophylline, choline theophyllinate, lysine theophyllinate or theophylline; therapeutic proteins and peptides, e.g., insulin or glucagon; vaccines, diagnostics, and gene therapies. It will be clear to a person skilled in the art that, where appropriate, the medicaments may be used in the form of salts, (e.g., as alkali metal or amine salts or as acid addition salts) or as esters (e.g., lower alkyl esters) or as solvates (e.g., hydrates) to optimise the activity and/or stability of the medicament.

Preferred medicaments are selected from albuterol, salmeterol, fluticasone propionate and beclomethasone dipropionate and salts or solvates thereof, e.g., the sulphate of albuterol and the xinafoate of salmeterol.

Medicaments can also be delivered in combinations. Preferred formulations containing combinations of active ingredients contain salbutamol (e.g., as the free base or the sulphate salt) or salmeterol (e.g., as the xinafoate salt) or formoterol (eg as the fumarate salt) in combination with an antiinflammatory steroid such as a beclomethasone ester (e.g., the dipropionate) or a fluticasone ester (e.g., the propionate) or budesonide. A particularly preferred combination is a combination of fluticasone propionate and salmeterol, or a salt thereof (particularly the xinafoate salt). A further combination of particular interest is budesonide and formoterol (e.g. as the fumarate salt).

It will be understood that the present disclosure is for the purpose of illustration only and the invention extends to modifications, variations and improvements thereto.

The application of which this description and claims form part may be used as a basis for priority in respect of any subsequent application. The claims of such

subsequent application may be directed to any feature or combination of features described therein. They may take the form of product, method or use claims and may include, by way of example and without limitation, one or more of the following claims:

**CLAIMS:**

1. A system for collecting and providing selective access to medical data relevant to plural patients having related medical conditions comprising

5

a network computer system;

associated with the network computer system, a first patient-specific database and a second condition-specific database;

10

remote from said network computer system, plural patient electronic data collectors, each for collecting patient data relevant to a particular patient's medical condition;

15

associated with each patient electronic data collector, a communicator for communicating with an entrypoint to said network computer system to enable transfer of said patient data to said first patient-specific database and to said second condition-specific database;

20

a first secure access gateway permitting access to the first patient-specific database in response to a first user authorisation command; and

a second secure access gateway permitting access to the second condition-specific database in response to a second user authorisation command.

25

2. A system according to claim 1, wherein said patient electronic data collector collects said patient data on a regular basis.

30

3. A system according to claim 2, wherein the patient electronic data collector collects the patient data on a continuous basis.

4. A system according to any of claims 1 to 3, wherein said patient data comprises diagnostic data for use in diagnosing each patient's medical condition.

5. A system according to any of claims 1 to 3, wherein said patient data comprises compliance data for use in assessing each patient's compliance with a treatment or prescribing regime.

5 6. A system according to any of claims 1 to 5, wherein each patient has a similar or identical medical condition.

10 7. A system according to any of claims 1 to 6, wherein each patient is on a similar or identical treatment or prescribing regime.

8. A system according to any of claims 1 to 7, wherein each patient electronic data collector is under the control of an individual patient.

15 9. A system according to any of claims 1 to 8, wherein any patient electronic data collector is integrated with a system for the delivery of medicament.

10 10. A system according to claim 9, wherein the medicament delivery system provides respirable delivery of medicament to the patient.

20 11. A system according to claim 9, wherein the medicament delivery system provides injectable delivery of medicament to the patient.

25 12. A system according to claim 9, wherein the medicament delivery system is an implant in the body of the patient.

13. A system according to any of claim 9 to 11, wherein the patient electronic data collector and the system for delivery of medicament are comprised within a handheld device.

30 14. A system according to any of claims 1 to 13, wherein the communicator is capable of communicating wirelessly with the entrypoint to the network computer system.

15. A system according to any of claims 1 to 14, wherein the patient data is communicable between the patient electronic data collector and the network computer system in encrypted form.

5 16. A system according to any of claims 1 to 15, wherein the patient data is continuously communicable between the patient electronic data collector and the network computer system.

10 17. A system according to any of claims 1 to 16, wherein the patient data is communicable in packet form between the patient electronic data collector and the network computer system.

15 18. A system according to any of claims 1 to 17, wherein the network computer system is under the control of a healthcare data manager.

20 19. A system according to claim 18, wherein the healthcare data manager is associated with a healthcare organisation selected from the group consisting of a doctor's practice, a hospital, a healthcare management centre and a pharmaceutical company.

25 20. A system according to any of claims 1 to 19, wherein the first patient-specific database and the second condition-specific database are separate from each other.

25 21. A system according to any of claims 1 to 19, wherein the first patient-specific database is a sub-database of the second condition-specific database.

30 22. A system according to any of claims 1 to 21, wherein the data within either database is partitioned according to level of confidentiality or level of commercial sensitivity.

23. A system according to any of claims 1 to 22, wherein the first and second secure access gateways are distinct from each other.

24. A system according to any of claims 1 to 22, wherein the first and second secure access gateways are coupled or arranged in series.

5 25. A system according to any of claims 1 to 24, wherein the secure access gateways are password protected.

26. A system according to any of claims 1 to 25, wherein the first and second user authorisation commands are distinct.

10 27. A system according to any of claims 1 to 25, wherein the first and second user authorisation commands are identical.

15 28. A system according to any of claims 1 to 27, wherein the authorised users are selected from the group consisting of the patient, a healthcare professional, a pharmacist, an emergency assistance provider, a research professional, a database manager and any combinations thereof.

20 29. A system according to any of claims 1 to 28, wherein access to either one or both of the databases involves payment of a fee through an electronic payment means.

30. A system according to any of claims 1 to 29, wherein communication of patient data to either one or both of the databases results in award of an incentive payment through an electronic payment means.

25 31. A system according to any of claims 1 to 30, enabling the patient to define permissions or authorisations at the time of data collection, data transfer, data storage and data access.

30 32. A system according to any of claims 1 to 31, wherein information from a remote datasource is made available to the network computer system.

33. A system according to claim 32, wherein said remote datasource comprises data relating to ambient environmental conditions.

34. A system according to claim 32, wherein the remote datasource comprises a database of prescribable medicaments.

5 35. A system according to any of claims 1 to 34, wherein the patient electronic data collector further comprises a patient electronic data management system comprising

a memory for storage of data;

10 a microprocessor for performing operations on said data; and

a transmitter for transmitting a signal relating to the data or the outcome of an operation on the data.

15 36. A system according to claim 35, wherein said patient electronic data management system additionally comprises a geographic positioning system.

20 37. A system according to either of claims 35 or 36, wherein the communicator enables two-way transfer of data between the network computer system and the patient electronic data management system.

25 38. A system according to any of claims 1 to 37, additionally comprising an authorised user data communicator comprising

an authorised user electronic data management system comprising

a memory for storage of data;

30 a microprocessor for performing operations on said data; and

a transmitter for transmitting a signal relating to the data or the outcome of an operation on the data; and

a communicator for communicating with an entrypoint to a network computer system to enable communication of data between the network computer system and the authorised user electronic data management system.

5       39.     A system according to claim 38 for the remote assessment of a patient's medical condition and remote prescription therefor comprising

a first authorised user data communicator capable of communicating a prescription authorisation command to the network computer system; and

10      a second authorised user data communicator capable of receiving a prescription authorisation command from the network computer system.

15      40.     A system according to any of claims 1 to 39, wherein any communicator employs radiofrequency or optical signals.

20      41.     A system according to any of claims 1 to 40, wherein any communicator communicates with the network computer system via a gateway thereto.

25      42.     A system according to any of claims 1 to 40, wherein the communicator includes an embedded network server.

30      43.     A system according to any of claims 1 to 42, wherein the communicator communicates with the network computer system via a second communications device having telecommunications capability.

35      44.     A system according to claim 43, wherein the telecommunications device comprises a cellular phone or pager.

40      45.     A system according to any of claims 42 to 44, wherein the communicator communicates with the second communications device using spread spectrum radiofrequency signals.

46. A system according to any of claims 1 to 46, wherein the communicator communicates with a specifiable network address of the network computer system.

5 47. A system according to claim 46, wherein the specifiable network address is selected from the group consisting of a web-site address, an e-mail address and a file transfer protocol address.

10 48. A system according to any of claims 35 to 47, wherein the patient electronic data management system additionally comprises a data input system for patient input of data to the electronic data management system.

15 49. A system according to claim 48, wherein said data input system comprises a man machine interface selected from a keypad, graphical user interface (GUI), voice recognition interface or biometrics interface.

20 50. A system according to any of claims 35 to 49, additionally comprising a display for display of data from the patient electronic data management system to the patient.

25 51. A system according to any of claims 1 to 50, wherein the plural patients have related respiratory conditions and each patient electronic data collector additionally comprises a sensor which senses the breath of a user, wherein the sensor communicates breath data to the patient electronic data collector.

52. A system according to claim 51, wherein said sensor comprises a breath-movable element which is movable in response to the breath of a patient.

30 53. A system according to claim 52, wherein said breath-movable element is selected from the group consisting of a vane, a sail, a piston and an impeller.

54. A system according to claim 52, wherein the sensor comprises a pressure sensor for sensing the pressure profile associated with the breath of a user.

55. A system according to claim 52, wherein the sensor comprises an airflow sensor for sensing the airflow profile associated with the breath of a user.

5 56. A system according to claim 52, wherein the sensor comprises a temperature sensor for sensing the temperature profile associated with the breath of a user.

10 57. A system according to claim 52, wherein the sensor comprises a moisture sensor for sensing the moisture profile associated with the breath of a user.

15 58. A system according to claim 52, wherein the sensor comprises a gas sensor for sensing the oxygen or carbon dioxide profile associated with the breath of a user.

20 59. A system according to any of claims 51 to 58, wherein said breath data includes breath cycle data.

60. A system according to any of claims 51 to 58, wherein said breath data includes peak flow data.

25 60. A system according to any of claims 1 to 50, wherein the plural patients have related cardiovascular conditions and each patient electronic data collector additionally comprises a sensor which senses the cardiovascular activity of a patient, wherein the sensor communicates cardiovascular data to the patient electronic data collector.

30 61. A system according to claim 60, wherein said sensor measures the blood pressure of the patient.

62. A method for collecting and providing selective user access to medical data relevant to plural patients having related medical conditions comprising

35 locally collecting patient data relevant to each patient's medical condition in electronic form;

communicating with an entrypoint to a network computer system to enable transfer of said patient data to a first patient-specific database and to a second condition-specific database of said network computer system; and

5

permitting first authorised user access to the first patient-specific database via a first secure access gateway, and/or permitting second authorised user access to the second condition-specific database via a second secure access gateway.

10

63. A method according to claim 62, comprising collecting the data on a regular basis.

15

64. A method according to claim 62, comprising collecting the data on a continuous basis.

20

65. A method according to any of claims 62 to 64, comprising communicating the data in encrypted form.

25

66. A method according to any of claims 62 to 65, wherein the data is continuously communicable.

67. A method according to any of claims 62 to 65, wherein the data is communicable in packet form.

30

68. A method according to any of claims 62 to 67, comprising permitting different levels of access to the data to different authorised users.

35

69. A method according to any of claims 62 to 68, additionally comprising

30

a first authorised user communicating a prescription authorisation command to the network computer system;

a second authorised user receiving said prescription authorisation command from the network computer system; and

35

said second authorised user preparing the prescription based on the prescription authorisation.

70. A method according to any of claims 62 to 68, additionally comprising

5

a first authorised user communicating a prescription authorisation command to a pharmacy network computer system;

10

a second authorised user receiving said prescription authorisation command from the pharmacy network computer system; and

said second authorised user preparing the prescription for the patient based on the prescription authorisation,

15

wherein the pharmacy network computer system is arranged for communication with the network computer system.

20

71. A method according to either of claims 69 or 70, wherein the first authorised user communicates the prescription authorisation in response to a 'update prescription' alerting signal visible at a patient-specific network address on the network computer system.

25

72. A network computer system for use with the system according to any of claims 1 to 61 comprising

an interface capable of receiving patient data in electronic form from plural patient electronic data collectors;

30

associated with said interface, a first patient-specific database and a second condition-specific database for storing said patient data; and

an authorised user inquiry system comprising either or both of

35

(a) a first secure access gateway permitting access to the first patient-specific database in response to a first user authorisation command;

first search means for searching said patient-specific database in response to a first authorised user inquiry; and

5 first results transmitting means for transmitting the results of said first authorised user inquiry to the first authorised user;

(b) a second secure access gateway permitting access to the second condition-specific database in response to a second user authorisation command;

10 second search means for searching said second condition-specific database in response to a second authorised user inquiry; and

15 second results transmitting means for transmitting the results of said second authorised user inquiry to the second authorised user,

wherein the patient data originates remotely from the network computer system.

20 73. Network computer system according to claim 72, wherein the network address comprises a web-site address or a file transfer protocol address.

25 74. A method for collecting and providing selective user access to medical data relevant to plural patients having related medical conditions, the method comprising

receiving data relevant to each patient's medical condition collected automatically at a plurality of locations;

storing some or all of the received data in a first, patient-specific database;

30 storing some or all of the received data in a second, condition-specific database;

allowing access to said first database in response to a first user authorisation command; and

allowing access to said second database in response to a second user authorisation command.

75. A method according to claim 74, wherein the data is received and  
5 access to the databases is allowed via a network using TCP/IP.

76. A computer program comprising program means for, when executed on a computer, instructing the computer to perform all of the steps of either one of claims 74 or 75.

10 77. A computer program product comprising a computer readable recording medium having recorded thereon a computer program comprising code means for, when executed on a computer, instructing said computer to perform the steps of

15 receiving data relevant to each patient's medical condition collected automatically at a plurality of locations;

20 storing some or all of the received data in a first, patient-specific database;

storing some or all of the received data in a second, condition-specific database;  
allowing access to said first database in response to a first user authorisation command; and

25 allowing access to said second database in response to a second user authorisation command.

## (12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
12 April 2001 (12.04.2001)

PCT

(10) International Publication Number  
**WO 01/26020 A1**

(51) International Patent Classification<sup>7</sup>: G06F 19/00, 1/00

pic., Park Road, Ware, Herts. SG12 0DP (GB). BONNEY, Stanley, George [GB/GB]; Glaxo Wellcome plc., Park Road, Ware, Herts. SG12 0DP (GB). JONES, Anthony, Patrick [GB/GB]; Glaxo Wellcome plc., Park Road, Ware, Herts. SG12 0DP (GB). ROBERTSON, Duncan [-/GB]; Glaxo Wellcome plc., Park Road, Ware, Herts. SG12 0DP (GB).

(21) International Application Number: PCT/EP00/09292

(74) Agent: PIKE, Christopher, Gerard; Pike & Co., Hayes Loft, 68A Hayes Place, Marlow, Buckinghamshire SL7 2BT (GB).

(22) International Filing Date:  
22 September 2000 (22.09.2000)

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(25) Filing Language: English

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE,

(26) Publication Language: English

[Continued on next page]

(30) Priority Data:

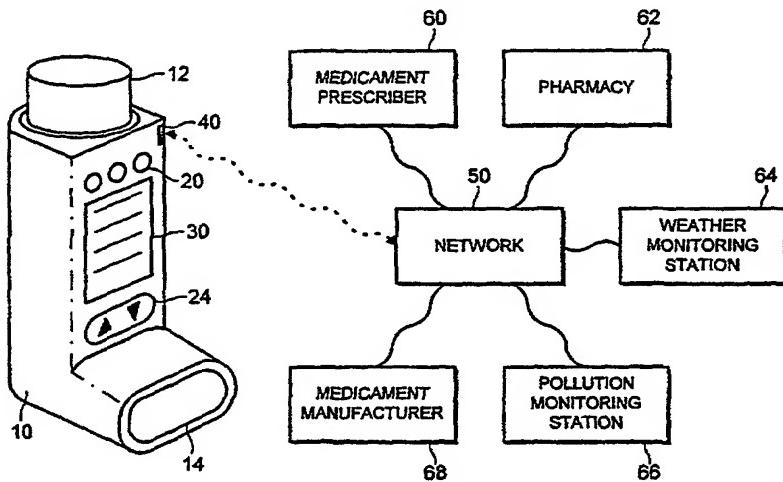
9923273.8	1 October 1999 (01.10.1999)	GB
0011029.6	9 May 2000 (09.05.2000)	GB
0020541.9	22 August 2000 (22.08.2000)	GB

(71) Applicant (*for all designated States except US*): GLAXO GROUP LIMITED [GB/GB]; Glaxo Wellcome House, Berkeley Avenue, Greenford, Middlesex UB6 0NN (GB).

(72) Inventors; and

(75) Inventors/Applicants (*for US only*): ANDERSON, Gregor, John, McLennan [GB/GB]; Glaxo Wellcome

(54) Title: PATIENT DATA MONITORING SYSTEM



(57) Abstract: There is provided a system for collecting and providing selective access to medical data relevant to plural patients having related medical conditions. The system comprises a network computer system (50) and associated with the network computer system (50) a first patient-specific database and a second condition-specific database. Remote from the network computer system (50) there are provided plural patient electronic data collectors (10), each for collecting patient data relevant to a particular patient's medical condition. Associated with each patient electronic data collector (10), there is a communicator (40) for communicating with an entrypoint to the network computer system (50) to enable transfer of said patient data to the first patient-specific database and to the second condition-specific database. The system includes a first secure access gateway permitting access to the first patient-specific database in response to a first user authorisation command and a second secure access gateway permitting access to the second condition-specific database in response to a second user authorisation command.

**WO 01/26020 A1**

1 / 8

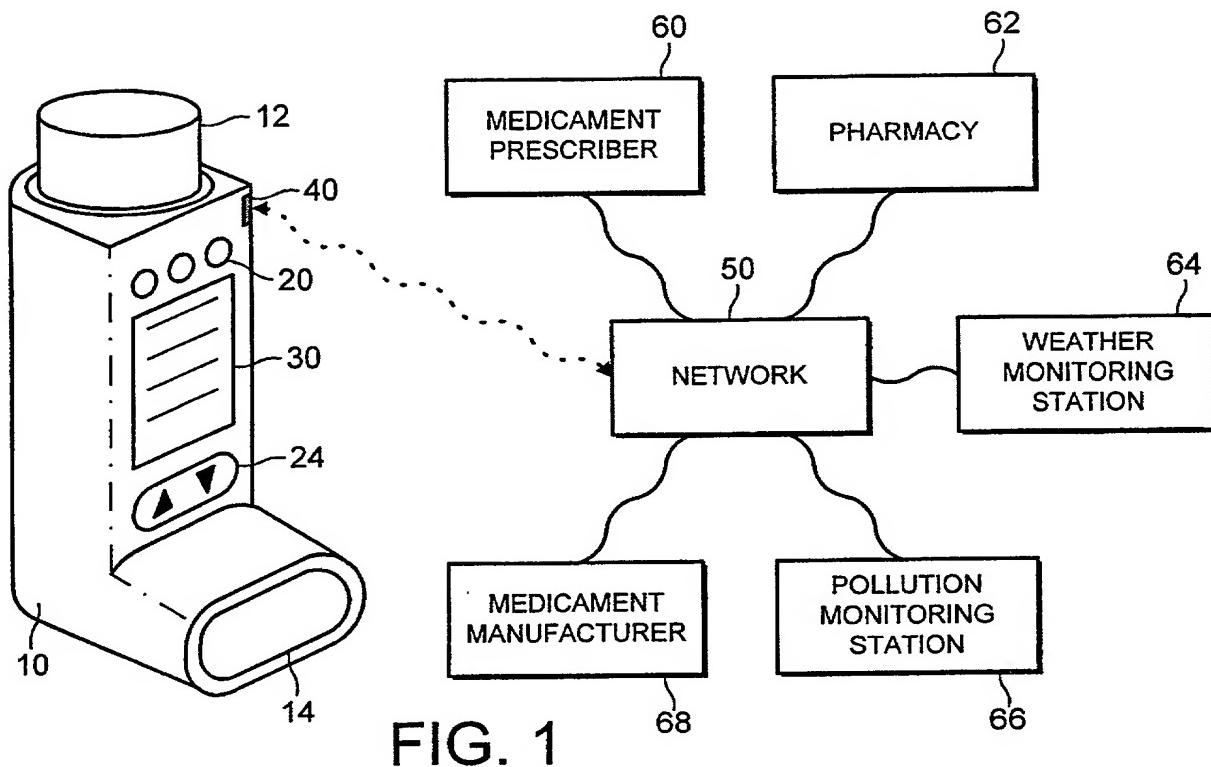


FIG. 1

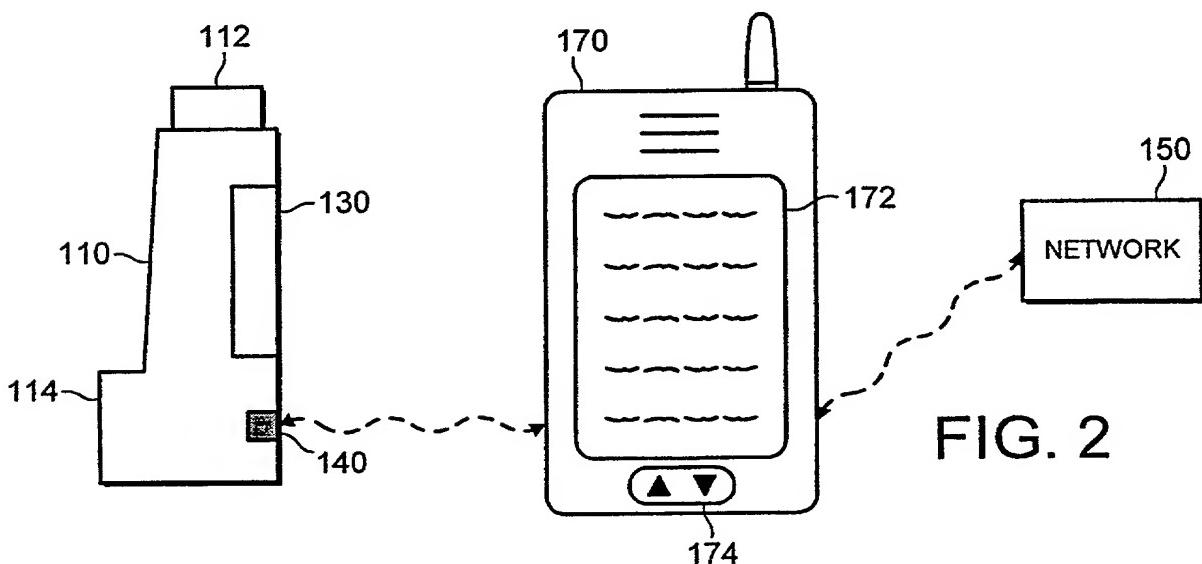
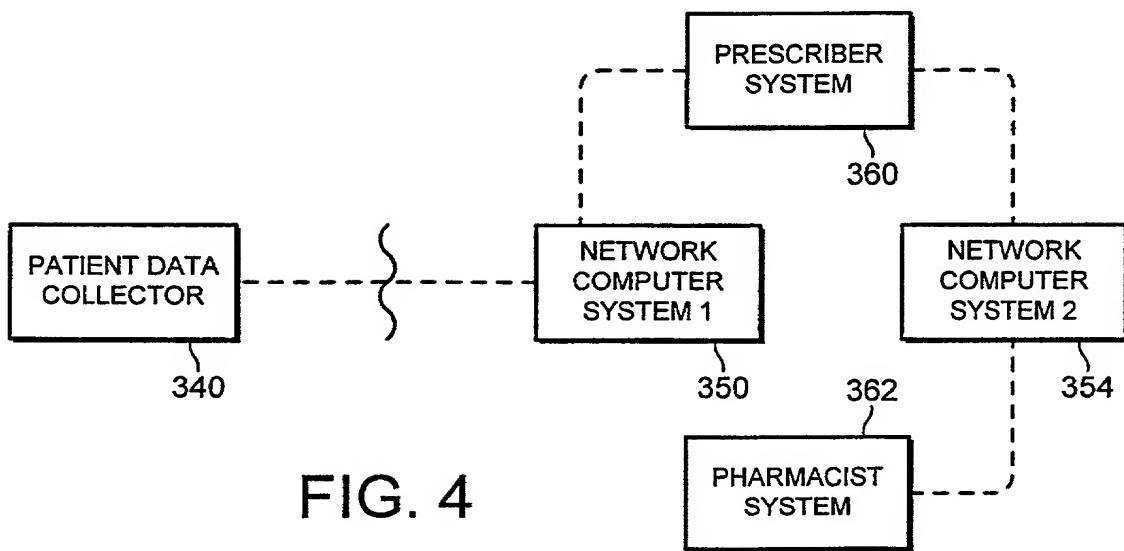
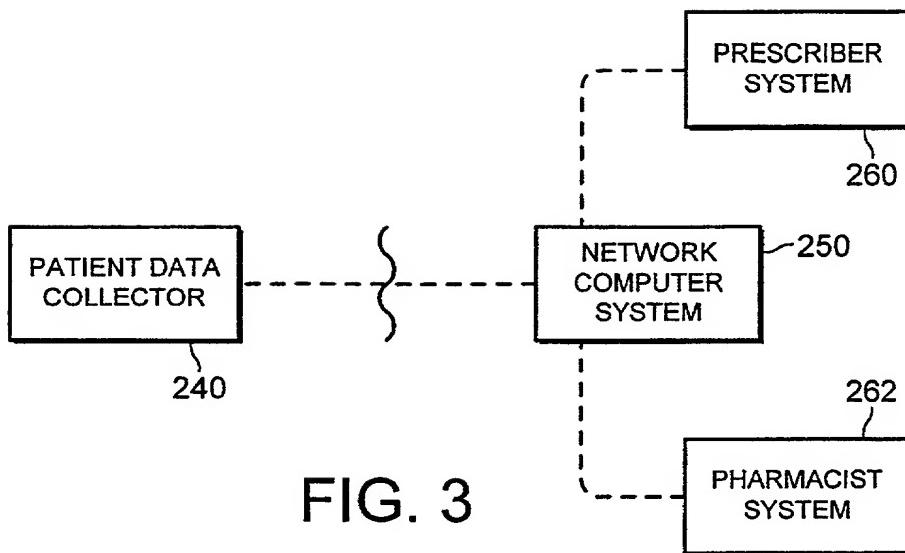


FIG. 2

2 / 8



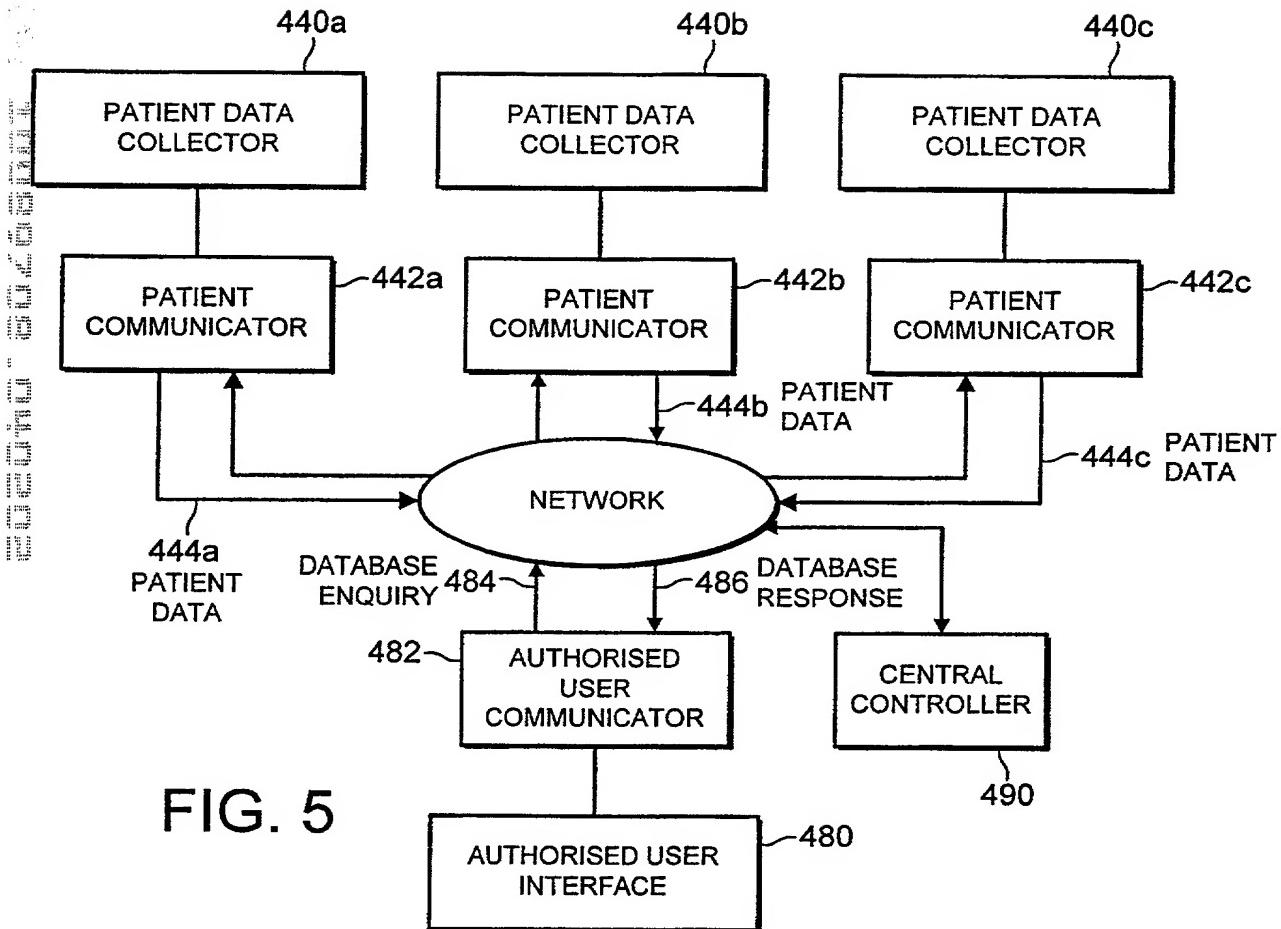


FIG. 5

4 / 8

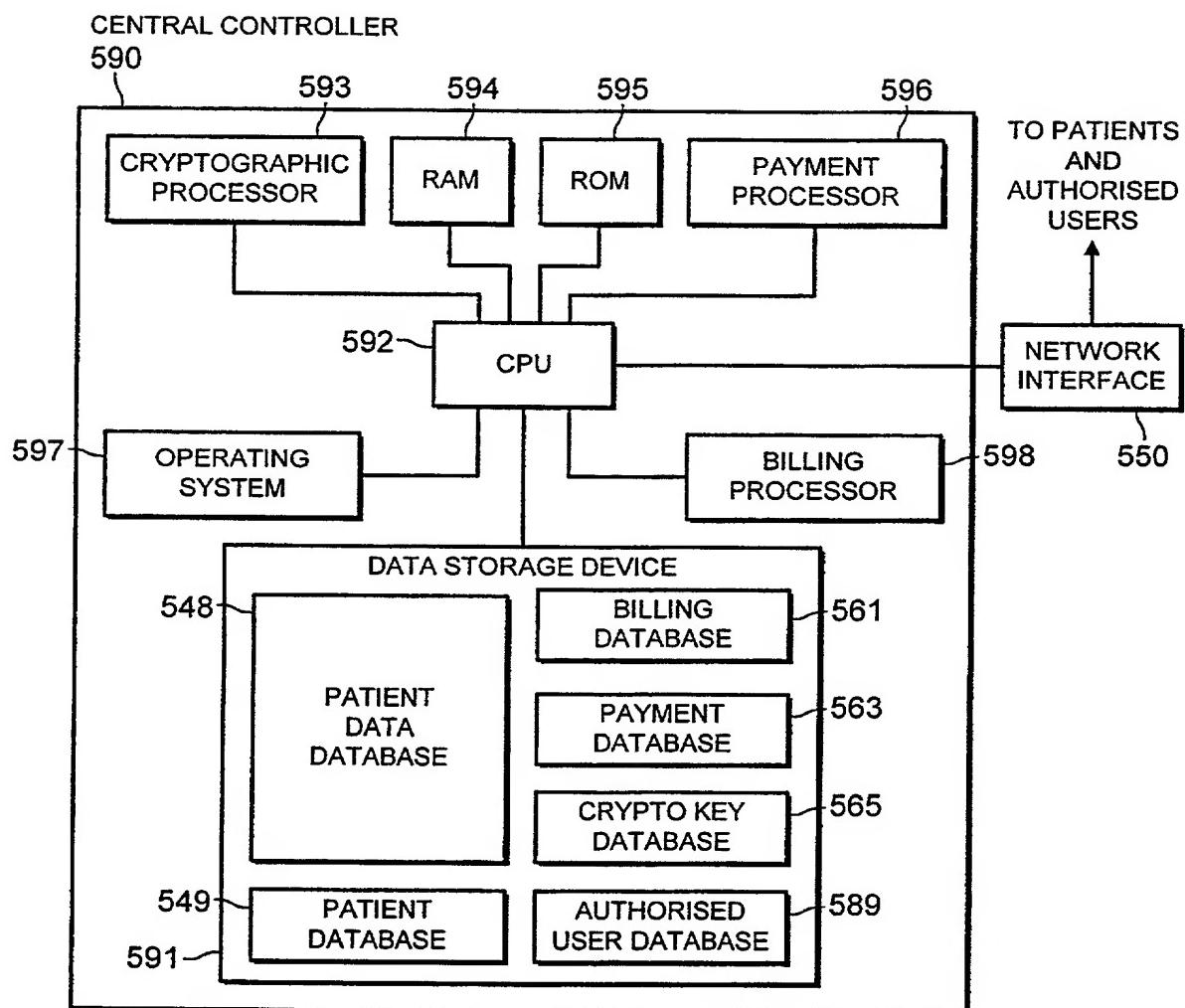


FIG. 6

5 / 8

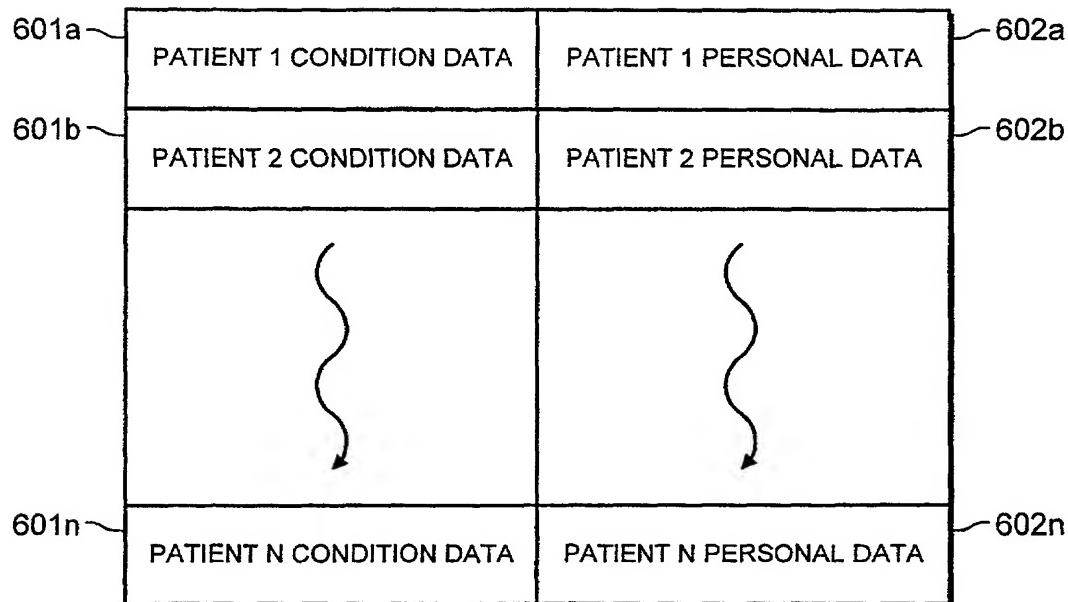


FIG. 7

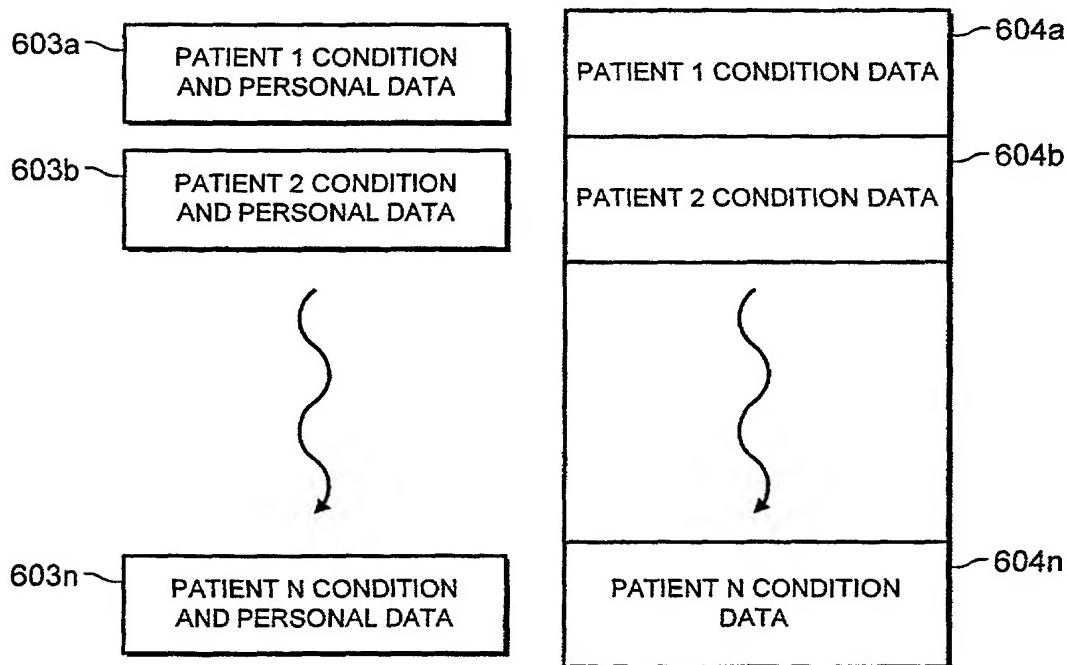


FIG. 8

6 / 8

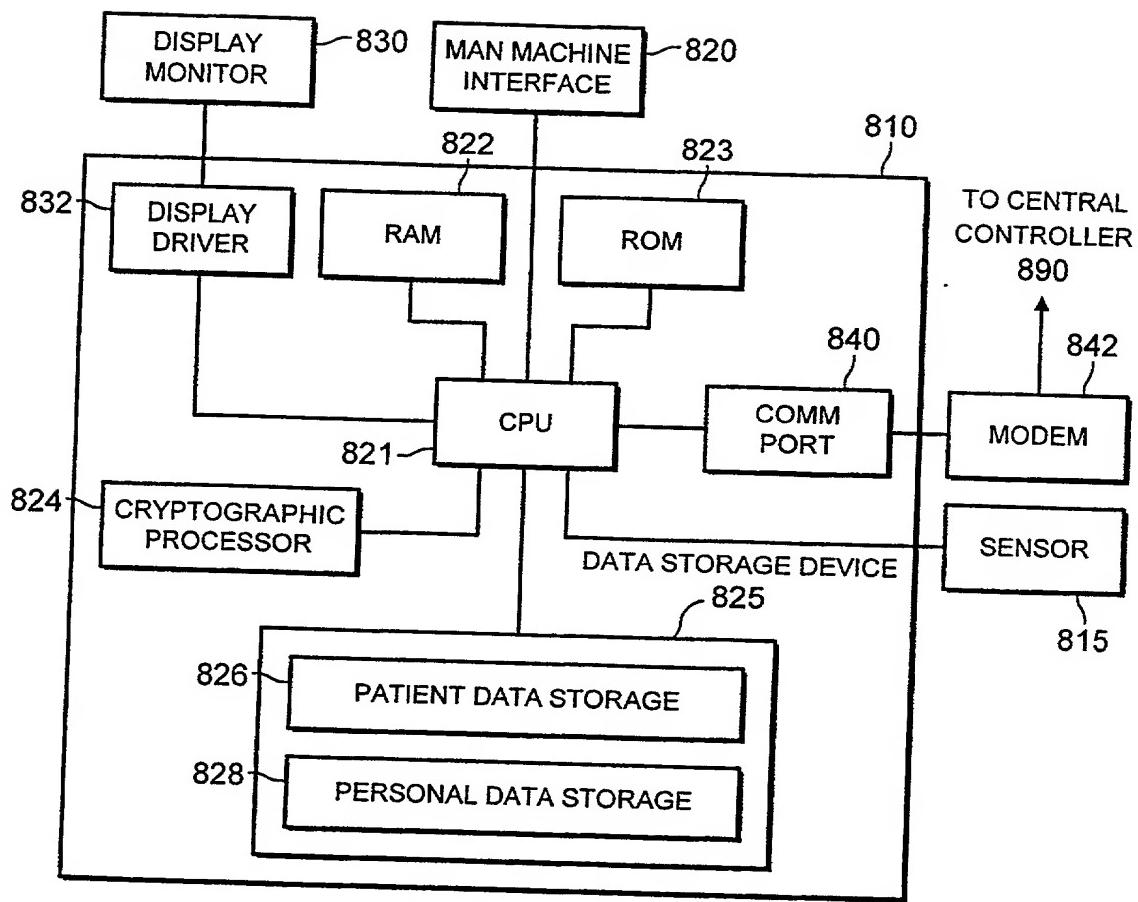


FIG. 9

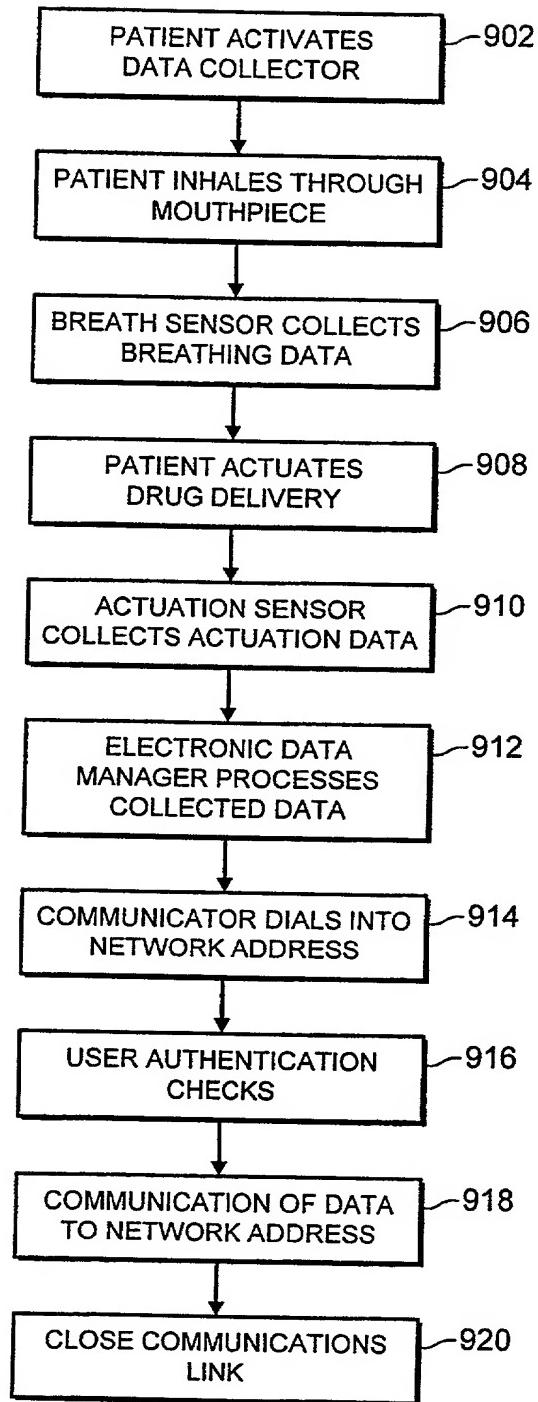


FIG. 10

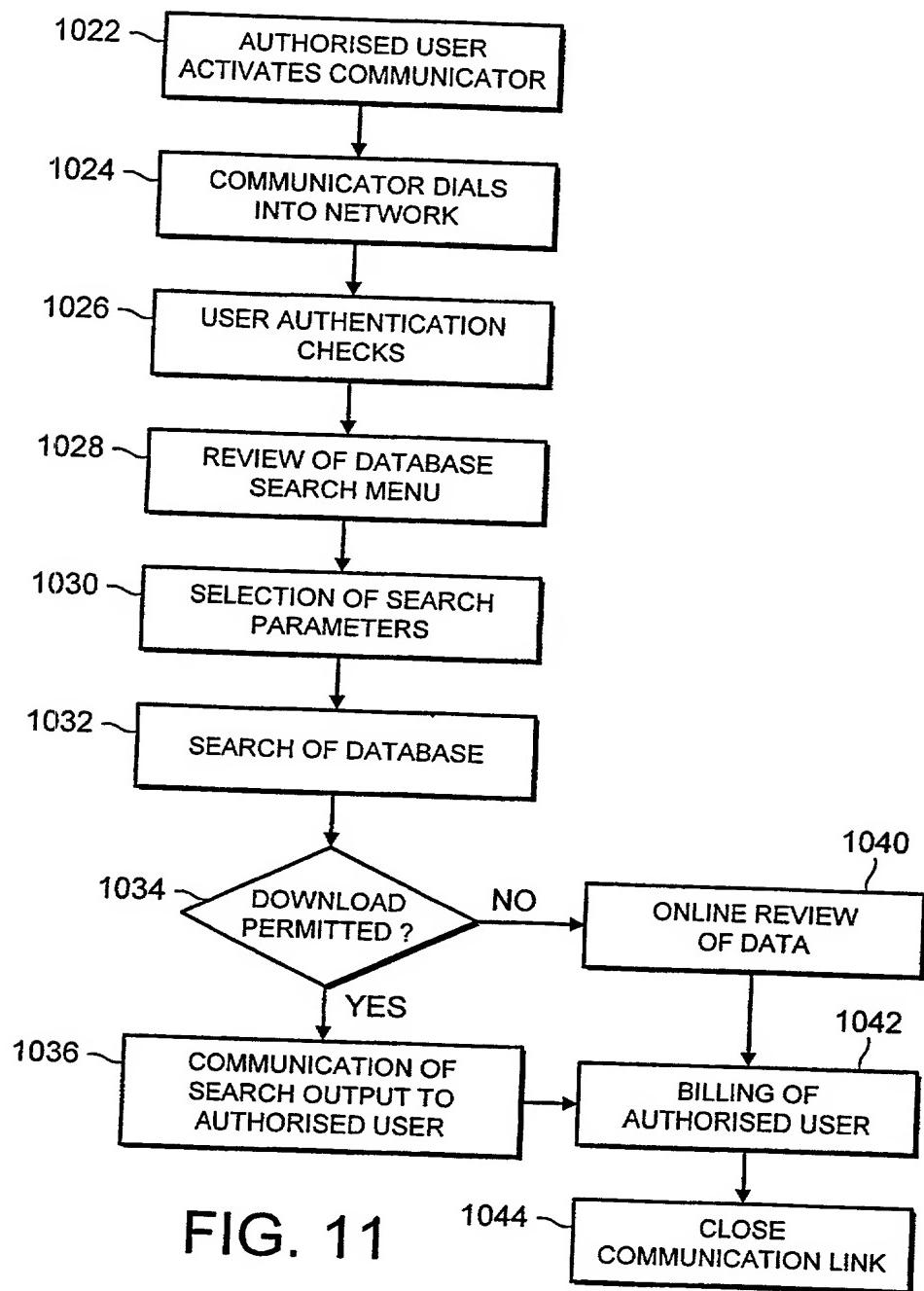


FIG. 11

## DECLARATION FOR "371" APPLICATION

**COMBINED DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION WITH POWER OF ATTORNEY**

- (X) Declaration submitted with initial filing or  
 Declaration submitted after initial filing (surcharge required 37CFR1.16(e))

ATTORNEY'S DOCKET PG4159USW
First Names Inventor: <b>Gregor John McLennan ANDERSON</b>
<i>Complete if known:</i> App No.:

Filing Date
Group Art Unit:

As below named inventor. I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

**PATENT DATA MONITORING SYSTEM**

the specification of which (check only one item below):

[ ] is attached hereto.

OR

[ x ] was filed on 22 September 2000 as United States application Serial No. \_\_\_\_\_ or PCT International

Application Number PCT/EP00/09292 filed and was amended on (MM/DD/YYYY) \_\_\_\_\_ (if applicable)

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR §1.56.

I hereby claim foreign priority benefits under 35, U.S.C. §119 (a)-(d) or §365(b) of any foreign applications(s) for patent or inventor's certificate or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate or of any PCT international application having a filing date before that of the application on which priority is claimed:

**PRIOR FOREIGN AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. 119:**

Prior Foreign Application Number (s)	Country	Foreign Filing Date (MM/DD/YYYY)	PRIORITY CLAIMED
1 9923273.8	GB	10/01/1999	X
2. 0011029.6	GB	05/09/2000	X
3. 0020541.9	GB	08/22/2000	X
4.			
5.			

I hereby claim the benefit under Title 35, United States Code §119(e) of any United States provisional application(s) listed below:

Application No.	Filing Date (MM/DD/YYYY)	
1.		
2.		
3.		

Express Mail No.:  
EV022025640US

## DECLARATION FOR "371" APPLICATION

**COMBINED DECLARATION FOR UTILITY or DESIGN  
PATENT APPLICATION WITH POWER OF ATTORNEY** Continued
ATTORNEY'S DOCKET NUMBER  
PG4159USW

I hereby claim the benefit under 35, U.S.C. §120 of any United States application or §365(c) of any PCT international application designating the United States of America that is listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. §112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 C.F.R. §1.56 which became available between the filing date of the prior application(s) and the national or PCT international filing date of this application:

**PRIOR U.S. PARENT APPLICATION or PCT PARENT APPLICATION**

		STATUS (Check one)		
U.S. Parent Application or PCT Parent Number	Parent Filing Date (MM/DD/YYYY)	PATENTED	PENDING	ABANDONED

**POWER OF ATTORNEY:** As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the U.S. Patent and Trademark Office connected therewith. (List name and registration number)



23347

PATENT TRADEMARK OFFICE

Send Correspondence to:

Direct Telephone Calls to:

Christopher P. Rogers  
919-483-1240

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

FULL NAME OF INVENTOR	FAMILY NAME <u>ANDERSON</u>	FIRST GIVEN NAME <u>Gregor</u>	SECOND GIVEN NAME/INITIAL <u>John, McLennan</u>
INVENTOR'S SIGNATURE	<u>Gregor J M Anderson</u>		
RESIDENCE & CITIZENSHIP	CITY <u>Ware</u>	STATE OR FOREIGN COUNTRY <u>GB</u>	COUNTRY OF CITIZENSHIP <u>GB</u>
POST OFFICE ADDRESS	CITY GlaxoSmithKline Five Moore Drive, PO Box 13398		
FULL NAME OF INVENTOR	FAMILY NAME <u>BONNEY</u>	FIRST GIVEN NAME <u>Stanley</u>	SECOND GIVEN NAME/INITIAL <u>George</u>
INVENTOR'S SIGNATURE	<u>Stanley Bonney</u>		
RESIDENCE & CITIZENSHIP	CITY <u>Ware</u>	STATE OR FOREIGN COUNTRY <u>GB</u>	COUNTRY OF CITIZENSHIP <u>GB</u>
POST OFFICE ADDRESS	CITY GlaxoSmithKline Five Moore Drive, PO Box 13398		
FULL NAME OF INVENTOR	FAMILY NAME <u>JONES</u>	FIRST GIVEN NAME <u>Anthony</u>	SECOND GIVEN NAME/INITIAL <u>Patrick</u>
INVENTOR'S SIGNATURE	<u>Anthony Jones</u>		
RESIDENCE & CITIZENSHIP	CITY <u>Ware</u>	STATE OR FOREIGN COUNTRY <u>GB</u>	COUNTRY OF CITIZENSHIP <u>GB</u>
POST OFFICE ADDRESS	CITY GlaxoSmithKline Five Moore Drive, PO Box 13398		
FULL NAME OF INVENTOR	FAMILY NAME <u>ROBERTSON</u>	FIRST GIVEN NAME <u>Duncan</u>	SECOND GIVEN NAME/INITIAL
INVENTOR'S SIGNATURE	<u>Duncan Robertson</u>		
RESIDENCE & CITIZENSHIP	CITY <u>Perth</u>	STATE OR FOREIGN COUNTRY <u>AU</u>	COUNTRY OF CITIZENSHIP <u>GB</u>
POST OFFICE ADDRESS	CITY GlaxoSmithKline Five Moore Drive, PO Box 13398		

**COMBINED DECLARATION FOR UTILITY OR DESIGN PATENT  
APPLICATION WITH POWER OF ATTORNEY**

(X) Declaration submitted with initial filing or

() Declaration submitted after initial filing (surcharge required 37CFR1.16(e))

ATTORNEY'S DOCKET  
PG4159USWFirst Names Inventor:  
**Gregor John  
McLennan  
ANDERSON****Complete if known:**  
App No.:

Filing Date

Group Art Unit:

As below named inventor. I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

**PATENT DATA MONITORING SYSTEM**

the specification of which (check only one item below):

[ ] is attached hereto.

OR

[ x ] was filed on 22 September 2000 as United States application Serial No. \_\_\_\_\_ or PCT InternationalApplication Number PCT/EP00/09292 filed and was amended on (MM/DD/YYYY) \_\_\_\_\_ (if applicable)

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR §1.56.

I hereby claim foreign priority benefits under 35, U.S.C. §119 (a)-(d) or §365(b) of any foreign applications(s) for patent or inventor's certificate or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate or of any PCT international application having a filing date before that of the application on which priority is claimed:

**PRIOR FOREIGN AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. 119:**

Prior Foreign Application Number (s)	Country	Foreign Filing Date (MM/DD/YYYY)	PRIORITY CLAIMED
1 9923273.8	GB	10/01/1999	X
2. 0011029.6	GB	05/09/2000	X
3. 0020541.9	GB	08/22/2000	X
4.			
5.			

I hereby claim the benefit under Title 35, United States Code §119(e) of any United States provisional application(s) listed below:

Application No.	Filing Date (MM/DD/YYYY)	
1.		
2.		
3.		

## DECLARATION FOR "371" APPLICATION

<b>COMBINED DECLARATION FOR UTILITY or DESIGN PATENT APPLICATION WITH POWER OF ATTORNEY</b>		<b>ATTORNEY'S DOCKET NUMBER</b> <b>PG4159USW</b>
---	--	---

I hereby claim the benefit under 35. U.S.C. §120 of any United States application or §365(c) of any PCT international application designating the United States of America that is listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. §112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 C.F.R. §1.56 which became available between the filing date of the prior application(s) and the national or PCT international filing date of this application:

**PRIOR U.S. PARENT APPLICATION or PCT PARENT APPLICATION**

		STATUS (Check one)		
U.S. Parent Application or PCT Parent Number	Parent Filing Date (MM/DD/YYYY)	PATENTED	PENDING	ABANDONED

**POWER OF ATTORNEY:** As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the U.S. Patent and Trademark Office connected therewith. (List name and registration number)



Send Correspondence to:	<b>23347</b> PATENT TRADEMARK OFFICE	Direct Telephone Calls to: Christopher P. Rogers 919-483-1240
-------------------------	---	---

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 229 230 231 232 233 234 235 236 237 238 239 239 240 241 242 243 244 245 246 247 248 249 249 250 251 252 253 254 255 256 257 258 259 259 260 261 262 263 264 265 266 267 268 269 269 270 271 272 273 274 275 276 277 278 279 279 280 281 282 283 284 285 286 287 288 289 289 290 291 292 293 294 295 296 297 298 299 299 300 301 302 303 304 305 306 307 308 309 309 310 311 312 313 314 315 316 317 318 319 319 320 321 322 323 324 325 326 327 328 329 329 330 331 332 333 334 335 336 337 338 339 339 340 341 342 343 344 345 346 347 348 349 349 350 351 352 353 354 355 356 357 358 359 359 360 361 362 363 364 365 366 367 368 369 369 370 371 372 373 374 375 376 377 378 379 379 380 381 382 383 384 385 386 387 388 389 389 390 391 392 393 394 395 396 397 398 399 399 400 401 402 403 404 405 406 407 408 409 409 410 411 412 413 414 415 416 417 418 419 419 420 421 422 423 424 425 426 427 428 429 429 430 431 432 433 434 435 436 437 438 439 439 440 441 442 443 444 445 446 447 448 449 449 450 451 452 453 454 455 456 457 458 459 459 460 461 462 463 464 465 466 467 468 469 469 470 471 472 473 474 475 476 477 478 479 479 480 481 482 483 484 485 486 487 488 489 489 490 491 492 493 494 495 496 497 498 498 499 499 500 501 502 503 504 505 506 507 508 509 509 510 511 512 513 514 515 516 517 518 519 519 520 521 522 523 524 525 526 527 528 529 529 530 531 532 533 534 535 536 537 538 539 539 540 541 542 543 544 545 546 547 548 549 549 550 551 552 553 554 555 556 557 558 559 559 560 561 562 563 564 565 566 567 568 569 569 570 571 572 573 574 575 576 577 578 579 579 580 581 582 583 584 585 586 587 588 589 589 590 591 592 593 594 595 596 597 598 598 599 599 600 601 602 603 604 605 606 607 608 609 609 610 611 612 613 614 615 616 617 618 619 619 620 621 622 623 624 625 626 627 628 629 629 630 631 632 633 634 635 636 637 638 639 639 640 641 642 643 644 645 646 647 648 649 649 650 651 652 653 654 655 656 657 658 659 659 660 661 662 663 664 665 666 667 668 669 669 670 671 672 673 674 675 676 677 678 679 679 680 681 682 683 684 685 686 687 688 689 689 690 691 692 693 694 695 696 697 698 698 699 699 700 701 702 703 704 705 706 707 708 709 709 710 711 712 713 714 715 716 717 718 719 719 720 721 722 723 724 725 726 727 728 729 729 730 731 732 733 734 735 736 737 738 739 739 740 741 742 743 744 745 746 747 748 749 749 750 751 752 753 754 755 756 757 758 759 759 760 761 762 763 764 765 766 767 768 769 769 770 771 772 773 774 775 776 777 778 779 779 780 781 782 783 784 785 786 787 788 789 789 790 791 792 793 794 795 796 797 797 798 799 799 800 801 802 803 804 805 806 807 808 809 809 810 811 812 813 814 815 816 817 818 819 819 820 821 822 823 824 825 826 827 828 829 829 830 831 832 833 834 835 836 837 838 839 839 840 841 842 843 844 845 846 847 848 849 849 850 851 852 853 854 855 856 857 858 859 859 860 861 862 863 864 865 866 867 868 869 869 870 871 872 873 874 875 876 877 878 879 879 880 881 882 883 884 885 886 887 888 889 889 890 891 892 893 894 895 896 897 897 898 899 899 900 901 902 903 904 905 906 907 908 909 909 910 911 912 913 914 915 916 917 918 919 919 920 921 922 923 924 925 926 927 928 929 929 930 931 932 933 934 935 936 937 938 939 939 940 941 942 943 944 945 946 947 948 949 949 950 951 952 953 954 955 956 957 958 959 959 960 961 962 963 964 965 966 967 968 969 969 970 971 972 973 974 975 976 977 978 979 979 980 981 982 983 984 985 986 987 988 988 989 989 990 991 992 993 994 995 995 996 997 997 998 998 999 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 1039 1040 1041 1042 1043 1044 1045 1046 1047 1048 1049 1049 1050 1051 1052 1053 1054 1055 1056 1057 1058 1059 1059 1060 1061 1062 1063 1064 1065 1066 1067 1068 1069 1069 1070 1071 1072 1073 1074 1075 1076 1077 1078 1079 1079 1080 1081 1082 1083 1084 1085 1086 1087 1088 1089 1089 1090 1091 1092 1093 1094 1095 1096 1097 1097 1098 1099 1099 1100 1101 1102 1103 1104 1105 1106 1107 1108 1109 1109 1110 1111 1112 1113 1114 1115 1116 1117 1118 1119 1119 1120 1121 1122 1123 1124 1125 1126 1127 1128 1129 1129 1130 1131 1132 1133 1134 1135 1136 1137 1138 1139 1139 1140 1141 1142 1143 1144 1145 1146 1147 1148 1149 1149 1150 1151 1152 1153 1154 1155 1156 1157 1158 1159 1159 1160 1161 1162 1163 1164 1165 1166 1167 1168 1169 1169 1170 1171 1172 1173 1174 1175 1176 1177 1178 1179 1179 1180 1181 1182 1183 1184 1185 1186 1187 1188 1189 1189 1190 1191 1192 1193 1194 1195 1196 1197 1197 1198 1199 1199 1200 1201 1202 1203 1204 1205 1206 1207 1208 1209 1209 1210 1211 1212 1213 1214 1215 1216 1217 1218 1219 1219 1220 1221 1222 1223 1224 1225 1226 1227 1228 1229 1229 1230 1231 1232 1233 1234 1235 1236 1237 1238 1239 1239 1240 1241 1242 1243 1244 1245 1246 1247 1248 1249 1249 1250 1251 1252 1253 1254 1255 1256 1257 1258 1259 1259 1260 1261 1262 1263 1264 1265 1266 1267 1268 1269 1269 1270 1271 1272 1273 1274 1275 1276 1277 1278 1279 1279 1280 1281 1282 1283 1284 1285 1286 1287 1288 1289 1289 1290 1291 1292 1293 1294 1295 1296 1297 1297 1298 1299 1299 1300 1301 1302 1303 1304 1305 1306 1307 1308 1309 1309 1310 1311 1312 1313 1314 1315 1316 1317 1318 1319 1319 1320 1321 1322 1323 1324 1325 1326 1327 1328 1329 1329 1330 1331 1332 1333 1334 1335 1336 1337 1338 1339 1339 1340 1341 1342 1343 1344 1345 1346 1347 1348 1349 1349 1350 1351 1352 1353 1354 1355 1356 1357 1358 1359 1359 1360 1361 1362 1363 1364 1365 1366 1367 1368 1369 1369 1370 1371 1372 1373 1374 1375 1376 1377 1378 1379 1379 1380 1381 1382 1383 1384 1385 1386 1387 1388 1389 1389 1390 1391 1392 1393 1394 1395 1396 1397 1397 1398 1399 1399 1400 1401 1402 1403 1404 1405 1406 1407 1408 1409 1409 1410 1411 1412 1413 1414 1415 1416 1417 1418 1419 1419 1420 1421 1422 1423 1424 1425 1426 1427 1428 1429 1429 1430 1431 1432 1433 1434 1435 1436 1437 1438 1439 1439 1440 1441 1442 1443 1444 1445 1446 1447 1448 1449 1449 1450 1451 1452 1453 1454 1455 1456 1457 1458 1459 1459 1460 1461 1462 1463 1464 1465 1466 1467 1468 1469 1469 1470 1471 1472 1473 1474 1475 1476 1477 1478 1479 1479 1480 1481 1482 1483 1484 1485 1486 1487 1488 1489 1489 1490 1491 1492 1493 1494 1495 1496 1497 1497 1498 1499 1499 1500 1501 1502 1503 1504 1505 1506 1507 1508 1509 1509 1510 1511 1512 1513 1514 1515 1516 1517 1518 1519 1519 1520 1521 1522 1523 1524 1525 1526 1527 1528 1529 1529 1530 1531 1532 1533 1534 1535 1536 1537 1538 1539 1539 1540 1541 1542 1543 1544 1545 1546 1547 1548 1549 1549 1550 1551 1552 1553 1554 1555 1556 1557 1558 1559 1559 1560 1561 1562 1563 1564 1565 1566 1567 1568 1569 1569 1570 1571 1572 1573 1574 1575 1576 1577 1578 1579 1579 1580 1581 1582 1583 1584 1585 1586 1587 1588 1589 1589 1590 1591 1592 1593 1594 1595 1596 1597 1597 1598 1599 1599 1600 1601 1602 1603 1604 1605 1606 1607 1608 1609 1609 1610 1611 1612 1613 1614 1615 1616 1617 1618 1619 1619 1620 1621 1622 1623 1624 1625 1626 1627 1628 1629 1629 1630 1631 1632 1633 1634 1635 1636 1637 1638 1639 1639 1640 1641 1642 1643 1644 1645 1646 1647 1648 1649 1649 1650 1651 1652 1653 1654 1655 1656 1657 1658 1659 1659 1660 1661 1662 1663 1664 1665 1666 1667 1668 1669 1669 1670 1671 1672 1673 1674 1675 1676 1677 1678 1679 1679 1680 1681 1682 1683 1684 1685 1686 1687 1688 1689 1689 1690 1691 1692 1693 1694 1695 1696 1697 1697 1698 1699 1699 1700 1701 1702 1703 1704 1705 1706 1707 1708 1709 1709 1710 1711 1712 1713 1714 1715 1716 1717 1718 1719 1719 1720 1721 1722 1723 1724 1725 1726 1727 1728 1729 1729 1730 173
---